CDP-302/302ES/520ES

SERVICE MANUAL

Refer to RM-D302/D502 Service Manual issued separately for information of the remote controller supplied with this set.

CDP-302, CDP-520ES:
US Model
CDP-302:
Canadian Model
CDP-302ES:
AEP Model
UK Model
E Model

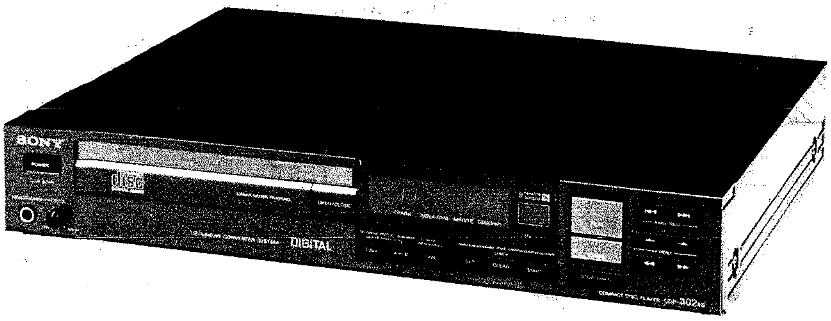


Photo: CDP-302ES

COMPACT
disc
DIGITAL AUDIO

SPECIFICATIONS

COMPACT DISC PLAYER

System	Compact disc digital audio system
Disc	Compact disc
Laser diode properties	Material: GaAlAs Wavelength: 780 nm Emission duration: Continuous Laser output: Max. 0.6 mW*

*This output is the value measured at a distance of about 1.6 mm from the objective lens surface on the optical pick-up block.

Spindle speed	500 r.p.m. to 200 r.p.m. (CLV)
Scan velocity	1.2 - 1.4 m/sec.
Error correction	Sony Super Strategy Cross Interleave Reed Solomon Code
Number of channels	2
D-A conversion	16-bit linear
Frequency response	2 - 20,000 Hz ±0.5 dB
Harmonic distortion	Less than 0.003 % (1 kHz)
Dynamic range	More than 96 dB
Channel separation	More than 95 dB

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY SHADING AND MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

Wow and flutter	Below measurable limit
Outputs	Line outputs Output level 2 V rms (at MSB) Load impedance over 10 kilohms Headphones 28 mW at 32 ohms
Other jacks	Remote control connectors (4-pin)

Disc

Track pitch	1.6 μm
Sampling frequency	44.1 kHz
Quantization	16 bit linear quantizing/channel
Modulation system	EFM
Transfer rate	2.03 Mbit/sec. (before modulation)

General

Dimensions	Approx. 430 × 80 × 335 mm (w/h/d) (17 × 3¹/₄ × 13¹/₄ in.) including projecting parts and controls
Weight	Approx. 6.7 kg (14 lb 13 oz), net

ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!

LES COMPOSANTS IDENTIFIÉS PAR UNE TRAME ET UNE MARQUE ⚠ SUR LES DIAGRAMMES SCHÉMATIQUES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈCES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DANS LES SUPPLÉMENTS PUBLIÉS PAR SONY.

MICROFILM

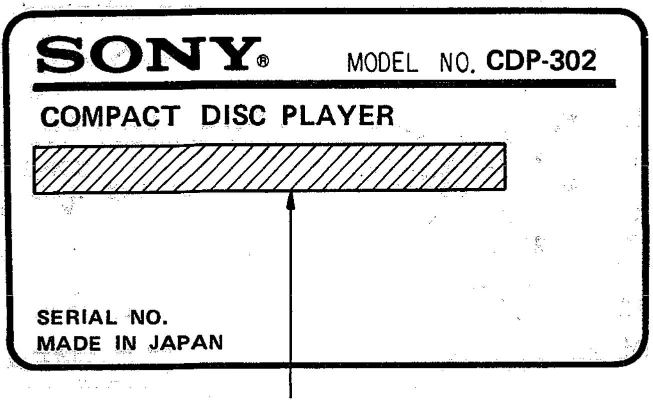
COMPACT DISK PLAYER

SONY®

AUD

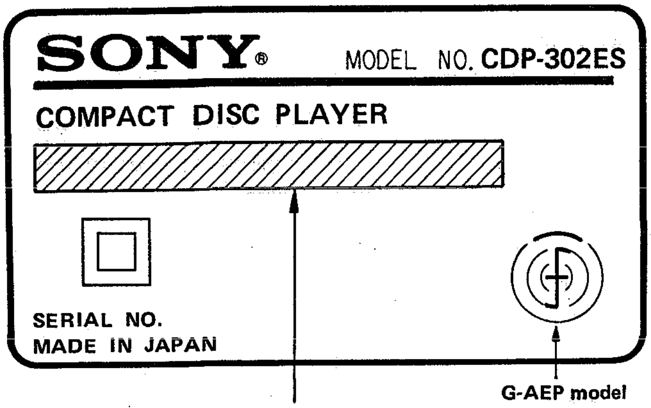
MODEL IDENTIFICATION

CDP-302


SONY®
MODEL NO. CDP-302
COMPACT DISC PLAYER
SERIAL NO.
MADE IN JAPAN

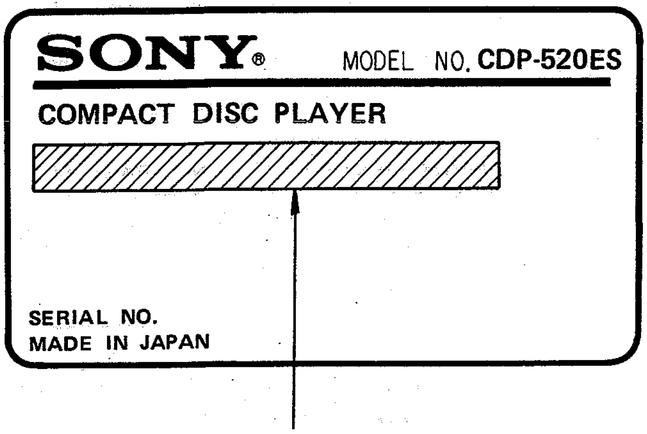
US model: AC: 120 V ~ 60 Hz 15 W
Canadian model: AC: 120 V ~ 60 Hz 15 W

CDP-302ES


SONY®
MODEL NO. CDP-302ES
COMPACT DISC PLAYER
SERIAL NO.
MADE IN JAPAN
G-AEP model

AEP model: AC: 220 V ~ 50/60 Hz 15 W
G-AEP model: AC: 220 V ~ 50/60 Hz 15 W
UK model: AC: 240 V ~ 50/60 Hz 15 W
E model: AC: 110, 120, 220, 240 V ~ 50/60 Hz 15 W

CDP-520ES


SONY®
MODEL NO. CDP-520ES
COMPACT DISC PLAYER
SERIAL NO.
MADE IN JAPAN

US model: AC: 120 V ~ 60 Hz 15 W

SAFETY CHECK-OUT (US Model)

After correcting the original service problem, perform the following safety check before releasing the set to the customer:
Check the antenna terminals, metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA (500 microampers). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2 V AC range are suitable. (See Fig. A)

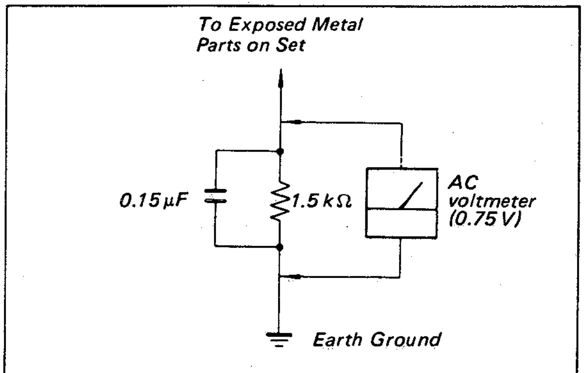

To Exposed Metal Parts on Set
0.15 μF
1.5 kΩ
AC voltmeter (0.75 V)
Earth Ground

Fig. A. Using an AC voltmeter to check AC leakage.

PROTECTION OF EYES FROM LASER BEAM DURING SERVICING

This set employs a laser. Therefore, be sure to follow carefully the instructions below when servicing.

WARNING !!

WHEN SERVICING, DO NOT APPROACH THE LASER EXIT WITH THE EYE TOO CLOSELY. IN CASE IT IS NECESSARY TO CONFIRM LASER BEAM EMISSION, BE SURE TO OBSERVE FROM A DISTANCE OF MORE THAN 30 cm FROM THE SURFACE OF THE OBJECTIVE LENS ON THE OPTICAL PICK-UP BLOCK.

1. Laser Diode Properties
   - Material: GaAlAs
   - Wavelength: 780 nm
   - Emission Duration: continuous
   - Laser Output: max. 0.6 mW*

     * This output is the value measured at a distance of about 1.6 mm from the objective lens surface on the Optical Pick-up Block.
   - Classification: Class IIIb
2. During service, do not take the Optical Pick-up Block apart, and do not adjust the APC circuit. If there is a breakdown in the APC circuit (including laser diode), replace the entire Optical Pick-up Block (including APC board).

LASER WARNING LABELS

The labels shown below are affixed.

1. Protective Housing Label
   DHHS Non-Interlocked Protective Housing Label
   ..... (US, Canadian model)

DANGER
INVISIBLE LASER RADIATION WHEN OPEN.
AVOID DIRECT EXPOSURE TO BEAM. 4-908-401-01

2. Interlock defeatable Label
   ..... (US, Canadian model)

DANGER
INVISIBLE LASER RADIATION WHEN OPEN AND INTERLOCK DEFEATED. AVOID DIRECT EXPOSURE TO BEAM.
4-908-402-01

- **US, Canadian model**

2. Aperture Label...... (AEP, UK, E model)

AVOID EXPOSURE
INVISIBLE LASER RADIATION IS EMITTED FROM THIS APERTURE.
4-908-404-01

- See figure on next page for location of label.

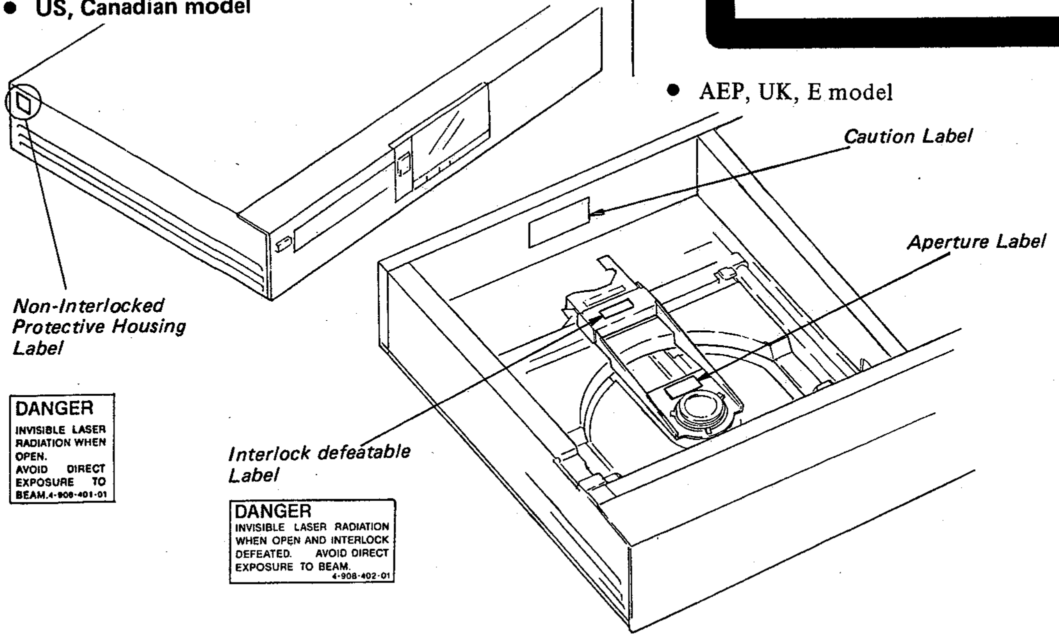
3. Caution Label...... (AEP, UK, E model)

CAUTION : INVISIBLE LASER RADIATION WHEN OPEN AND INTERLOCKS DEFEATED. AVOID EXPOSURE TO BEAM.

ADVARSEL : USYNLIG LASERSTRÅLING VED ÅBNING NÅR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION UNDGÅ UDSÆTTELSE FOR STRÅLING.

4 865 843 02

- AEP, UK, E model


Caution Label
Aperture Label
Non-Interlocked Protective Housing Label
Interlock defeatable Label

DANGER
INVISIBLE LASER RADIATION WHEN OPEN.
AVOID DIRECT EXPOSURE TO BEAM. 4-908-401-01

DANGER
INVISIBLE LASER RADIATION WHEN OPEN AND INTERLOCK DEFEATED. AVOID DIRECT EXPOSURE TO BEAM.
4-908-402-01

BESKYTTELSE AF ØJNE MOD LASERSTRÅLING UNDER SERVICE

I dette apparat anvendes laserlys. Derfor skal nedenstående instruktioner nøje følges under service.

Følg iøvrigt instruktionerne i servicemanualen.

ADVARSEL!!

Under service må øjnene ikke komme nær objektiv-linsen på den optiske pick-up enhed. I tilfælde af at det er nødvendigt at kontrollere udsendelsen af laserlys, skal det ske i en afstand af mere end 30 cm fra den optiske pick-up.

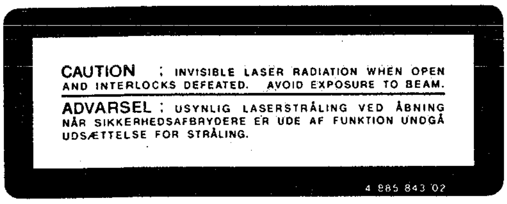
1. Data for Laser Diode
   - Materiale: GaAlAs
   - Bølgelængde: 780 nm
   - Udstråling: Kontinuerlig
   - Laser Output: max. 0.6 mW*

     * målt i 1.6 mm afstand fra overfladen af objektiv-linsen på den optiske pick-up enhsd.
   - Klassifikation: Svarende til klasse IIIb
2. Adskil aldrig den optiske pick-up enhed under service, og juster ikke APC kredsløbet (Automatic Power Control). Hvis APC kredsløbet (incl. laser-dioden) bryder ned, skal hele den optiske pick-up enhed (incl. APC printkortet) udskiftes.

LASER ADVARSEL MÆRKNING (AEP model)

Følgende mærkning findes indvendig i apparatet:

1. Advarsel Mærkning

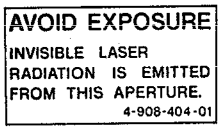


CAUTION : INVISIBLE LASER RADIATION WHEN OPEN AND INTERLOCKS DEFEATED. AVOID EXPOSURE TO BEAM.

ADVARSEL : USYNLIG LASERSTRÅLING VED ÅBNING NÅR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION UNDGÅ UDSÆTTELSE FOR STRÅLING.

4 885 843 02

2. Aperture Label

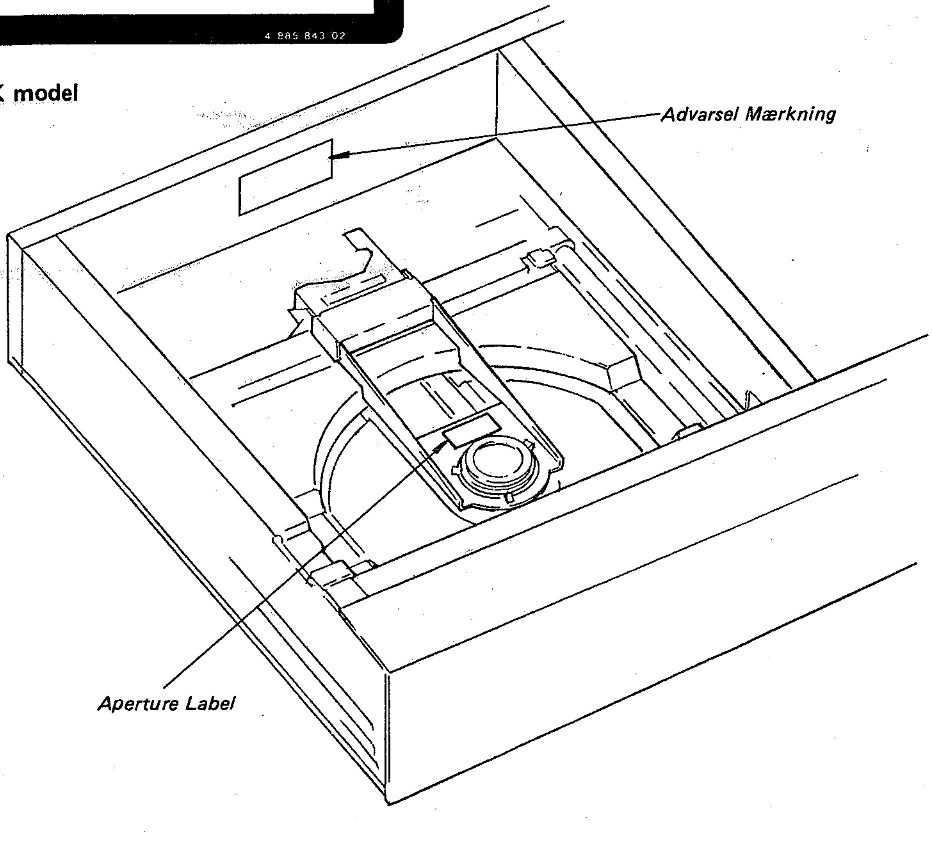


AVOID EXPOSURE

INVISIBLE LASER RADIATION IS EMITTED FROM THIS APERTURE.

4-908-404-01

- **AEP, UK model**



— CAUTION FOR ELECTROSTATIC BREAKDOWN —

NOTES ON HANDLING THE OPTICAL PICK-UP BLOCK (BU-1)

The laser diode in the optical pick-up block may suffer electrostatic breakdown because of the potential difference generated by the charged electrostatic load, etc. on clothing and the human body.

The printed matter below is included in the repair parts. During repair, use the procedure in the printed matter.

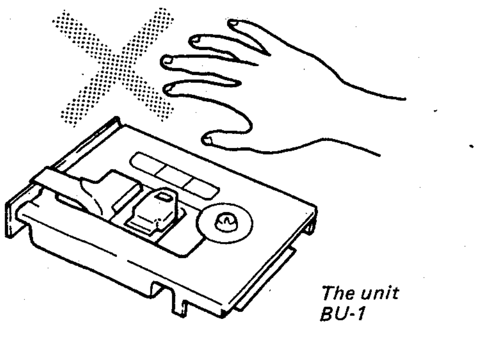
The following method is an example for reference purposes:

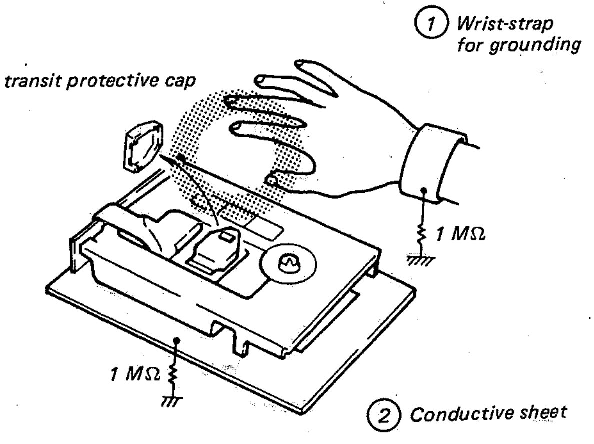
1. Place a conductive sheet on the workbench. (The black sheet used as repair parts wrapping).
2. Place the set on the conductive sheet so that the chassis touches the sheet. (This makes it the same potential as the conductive sheet).
3. Place your hands on the conductive sheet. (This makes them the same potential as the sheet).
4. Remove the optical pick-up block.
5. Perfrom work on top of the conductive sheet. Be careful that clothing does not touch the optical pick-up block.

Printed Matter Included in the Repair Parts

When opening or repairing a BU-1, the procedure for grounding as follows is required to prevent damage caused by static electricity.

1. Grounding for the human body.
   Be sure to put on a wrist-strap for grounding (with impedance lower than $10^8\,\Omega$) whose other end is grounded The strap works to drain away the static electricity built-up on the human body.
2. Grounding for the work table.
   Be sure to lay on the table a cunductive sheet (with impedance lower than $10^9\,\Omega$) such as sheet of copper which is grounded.
3. As static electricity built-up on clothes is not drained away, be careful not to let your clothes touch the BU-1.





– SERVICING NOTE –

NOTES ON LASER DIODE EMISSION CHECK

The laser beam on this model is concentrated so as to be focused on the disc reflective surface by the objective lens in the optical pick-up block. Therefore, when checking the laser diode emission, observe, from more than 30 cm away from the objective lens.

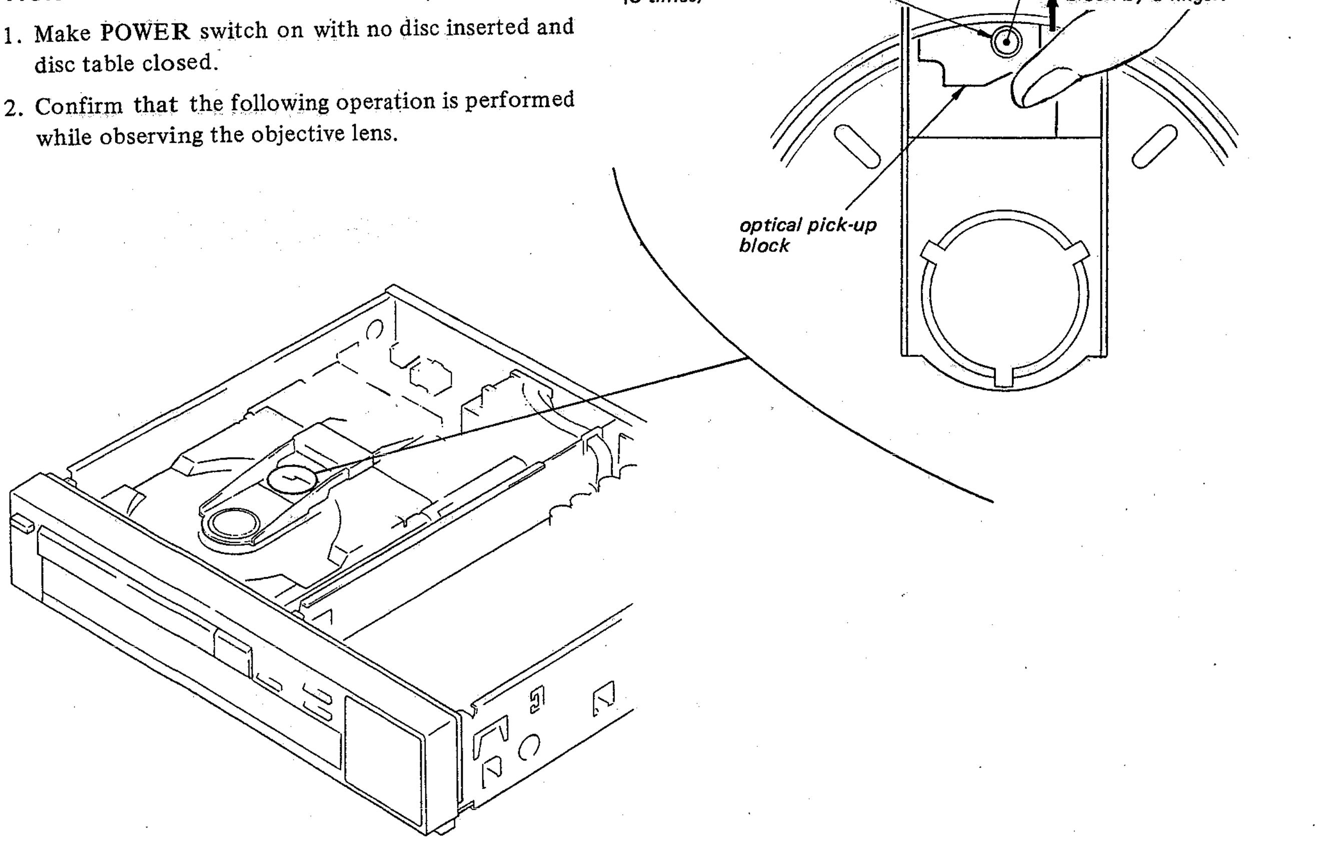
LASER DIODE AND FOCUS SERCH OPERATION CHECK

1. Make POWER switch on with no disc inserted and disc table closed.
2. Confirm that the following operation is performed while observing the objective lens.

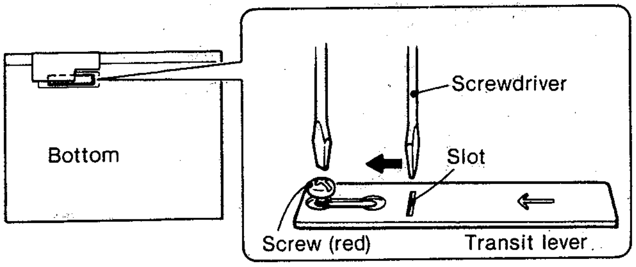
❷ Cofirm that laser beam is spread.

❶ Hold down optical pick-up block by a finger.

❸ Up and down motion of the objective lens. (3 times)



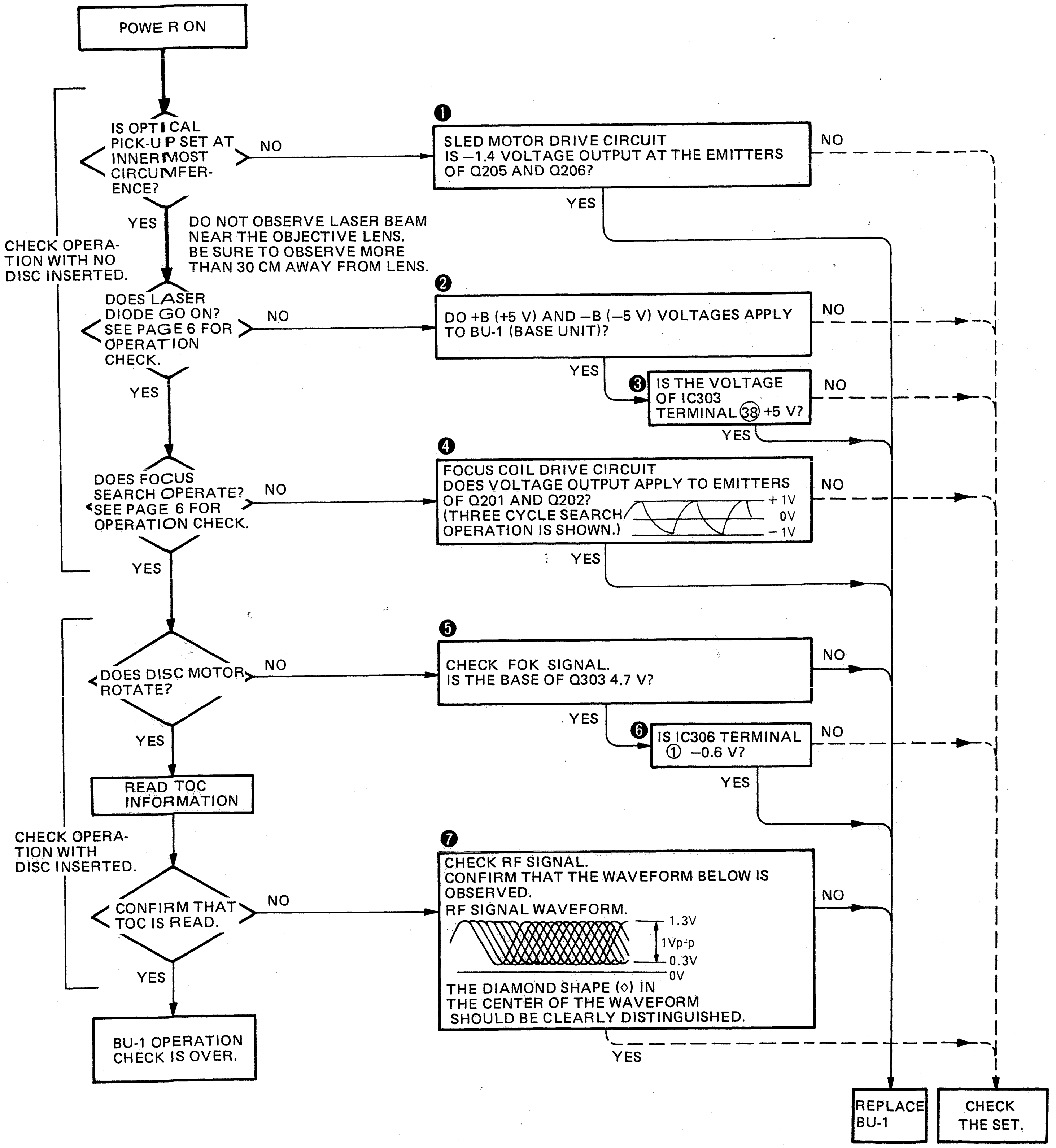
A transit lever is provided at the bottom of the unit to protect the optical system against shock during transportation. Before starting repairing, make following procedures.



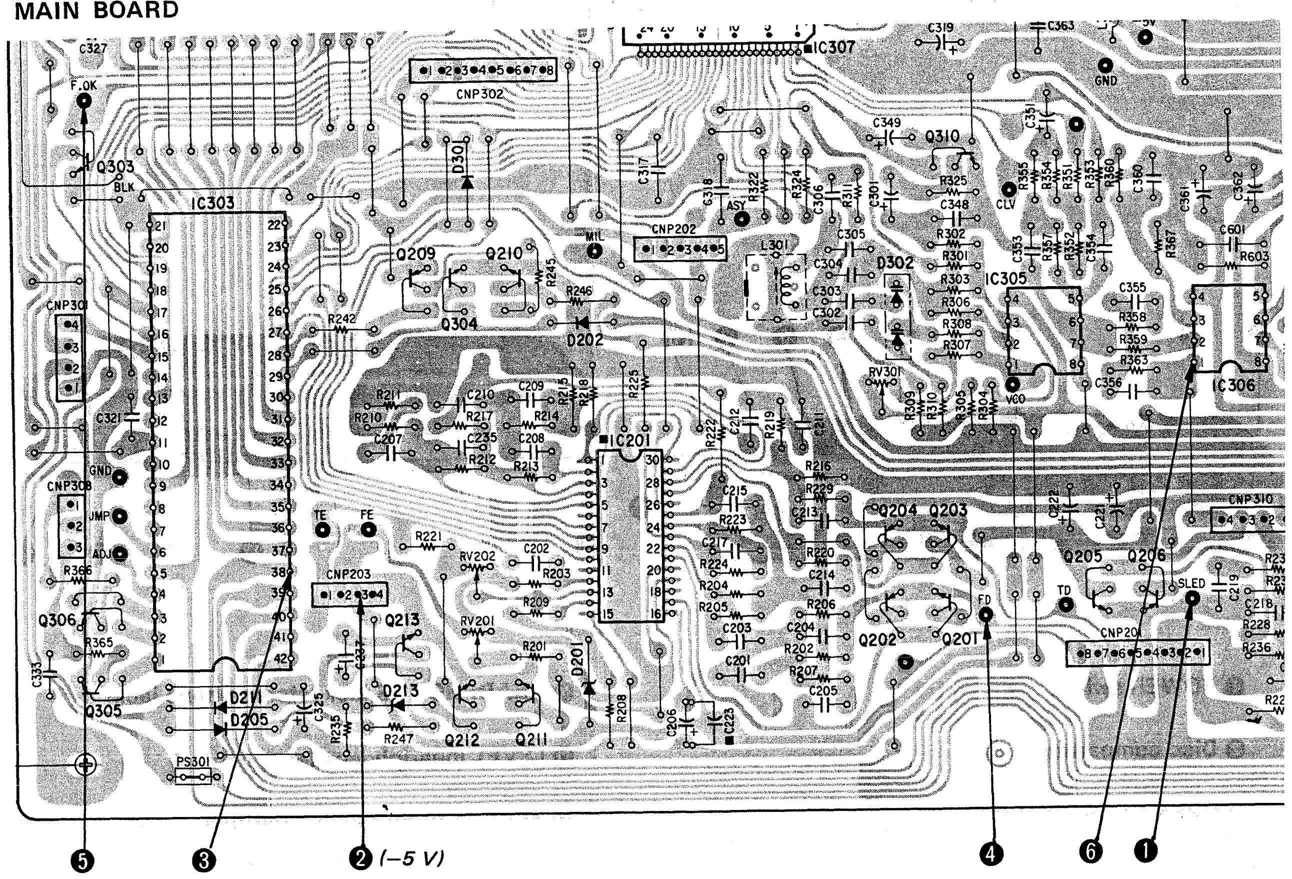
1. Loosen the screw (red) with the screwdriver.
2. Insert the screwdriver into the slot in the lever and move it in the direction of the arrow until it stops.
3. Tighten the screw.

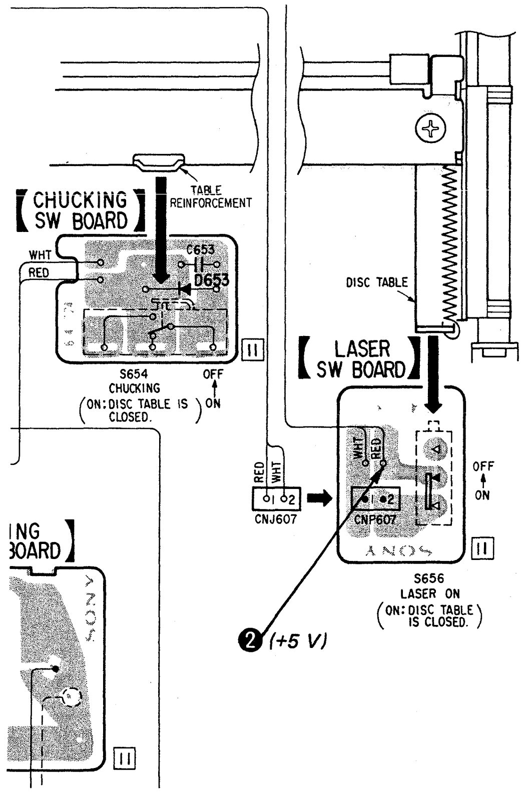
FLOW CHART OF BU-1 (BASE UNIT) TROUBLE SHOOTING

- Confirm all connectors around BU-1 (base unit) are secured before teh following check.

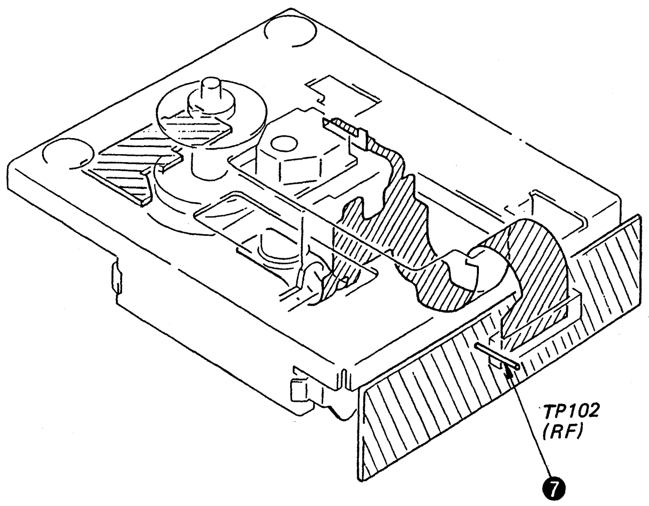

POWER ON
IS OPTICAL PICK-UP SET AT INNERMOST CIRCUMFERENCE?
NO
❶ SLED MOTOR DRIVE CIRCUIT IS −1.4 VOLTAGE OUTPUT AT THE EMITTERS OF Q205 AND Q206?
NO
YES
YES
DO NOT OBSERVE LASER BEAM NEAR THE OBJECTIVE LENS. BE SURE TO OBSERVE MORE THAN 30 CM AWAY FROM LENS.
CHECK OPERATION WITH NO DISC INSERTED.
DOES LASER DIODE GO ON? SEE PAGE 6 FOR OPERATION CHECK.
NO
❷ DO +B (+5 V) AND −B (−5 V) VOLTAGES APPLY TO BU-1 (BASE UNIT)?
NO
YES
❸ IS THE VOLTAGE OF IC303 TERMINAL ㊳ +5 V?
NO
YES
YES
DOES FOCUS SEARCH OPERATE? SEE PAGE 6 FOR OPERATION CHECK.
NO
❹ FOCUS COIL DRIVE CIRCUIT DOES VOLTAGE OUTPUT APPLY TO EMITTERS OF Q201 AND Q202? (THREE CYCLE SEARCH OPERATION IS SHOWN.)
+1V
0V
−1V
NO
YES
YES
DOES DISC MOTOR ROTATE?
NO
❺ CHECK FOK SIGNAL. IS THE BASE OF Q303 4.7 V?
NO
YES
❻ IS IC306 TERMINAL ① −0.6 V?
NO
YES
YES
READ TOC INFORMATION
CHECK OPERATION WITH DISC INSERTED.
CONFIRM THAT TOC IS READ.
NO
❼ CHECK RF SIGNAL. CONFIRM THAT THE WAVEFORM BELOW IS OBSERVED. RF SIGNAL WAVEFORM.
1.3V
1Vp-p
0.3V
0V
THE DIAMOND SHAPE (◊) IN THE CENTER OF THE WAVEFORM SHOULD BE CLEARLY DISTINGUISHED.
NO
YES
YES
BU-1 OPERATION CHECK IS OVER.
REPLACE BU-1
CHECK THE SET.

MAIN BOARD

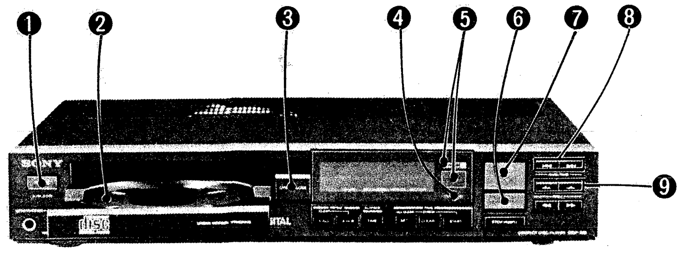

F.OK
Q303
IC303
IC307
CNP302
CNP202
CNP203
CNP301
CNP308
CNP310
IC201
IC305
IC306
Q209
Q210
Q304
Q310
D302
Q204
Q203
Q205
Q206
Q201
Q202
Q213
Q212
Q211
Q305
Q306
TE
FE
FD
TD
SLED
GND
CLV
VCO
PS301
❺
❸
❷ (−5 V)
❹
❻
❶

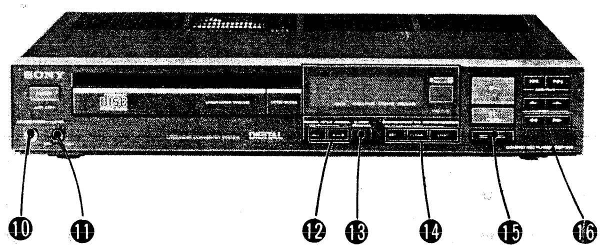

CHUCKING SW BOARD
TABLE REINFORCEMENT
WHT
RED
C653
D653
S654 CHUCKING (ON: DISC TABLE IS CLOSED.)
OFF
ON
DISC TABLE
LASER SW BOARD
RED
WHT
CNJ607
CNP607
OFF
ON
S656 LASER ON (ON: DISC TABLE IS CLOSED.)
❷ (+5 V)
ING BOARD

BU-1 (BASE UNIT)



LOCATION AND FUNCTION OF CONTROLS





① POWER switch

② Disc compartment

③ OPEN/CLOSE button

④ RMS PLAY indicator

⑤ REMOTE SENSOR and indicator (for remote control)

⑥ ❙❙ PAUSE button and indicator

⑦ ▶ PLAY button and indicator

⑧ AMS/RMS buttons

⑨ INDEX buttons

⑩ HEADPHONES jack (stereo phone jack)

⑪ LEVEL (headphones level) control

⑫ REPEAT programming buttons

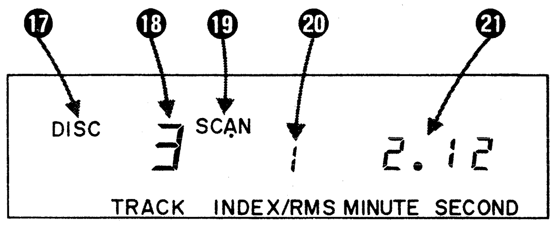
⑬ ELAPSED/REMAINING TIME button

⑭ RMS buttons

⑮ STOP (RESET) button

⑯ Manual search buttons

Display window



⑰ DISC indicator

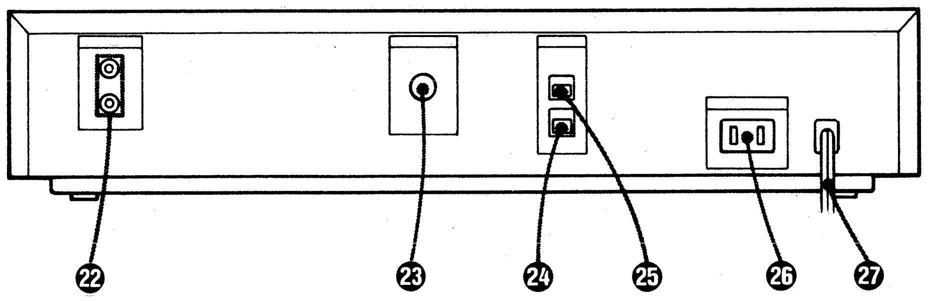
⑱ TRACK indicator

⑲ SCAN indicator

⑳ INDEX/RMS indicator

㉑ Time counter

Rear panel



㉒ LINE OUT jacks

㉓ SUBCODE connector
This connector is provided to extend the utility of this compact disc player by allowing for the connection of optional equipment which will be available in the future.

㉔ R REMOTE OUT (remote control output) connector
Connect this connector to remote control input connector of optional Sony TC-W7R cassette deck, etc. For details, refer to the operating instructions of the RM-S410 system controller.

㉕ R REMOTE IN (remote control input) connector
Connect this connector to remote control output connector of optional. Sony RM-S410 system remote controller. For details, refer to the operating instructions of the RM-S410 system controller.

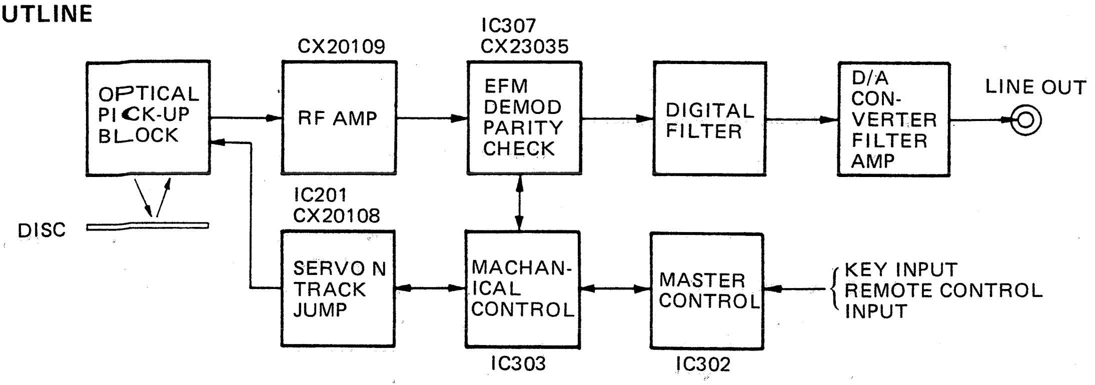
㉖ AC OUTLET

㉗ AC power cord

SECTION 1
OUTLINE

CIRCUIT DESCRIPTION

1-1. OUTLINE


OPTICAL PICK-UP BLOCK
DISC
CX20109
RF AMP
IC307
CX23035
EFM DEMOD PARITY CHECK
DIGITAL FILTER
D/A CONVERTER FILTER AMP
LINE OUT
IC201
CX20108
SERVO N TRACK JUMP
MACHANICAL CONTROL
IC303
MASTER CONTROL
IC302
KEY INPUT
REMOTE CONTROL INPUT

Above block diagram shows configuration of this set. Master control IC (IC302) serves as the center of all operation. Master control IC (IC302) assumes interface between man and machine like key input and remote control input. Mechanical control IC (IC303) assumes interface between master control IC (IC302) and machine.

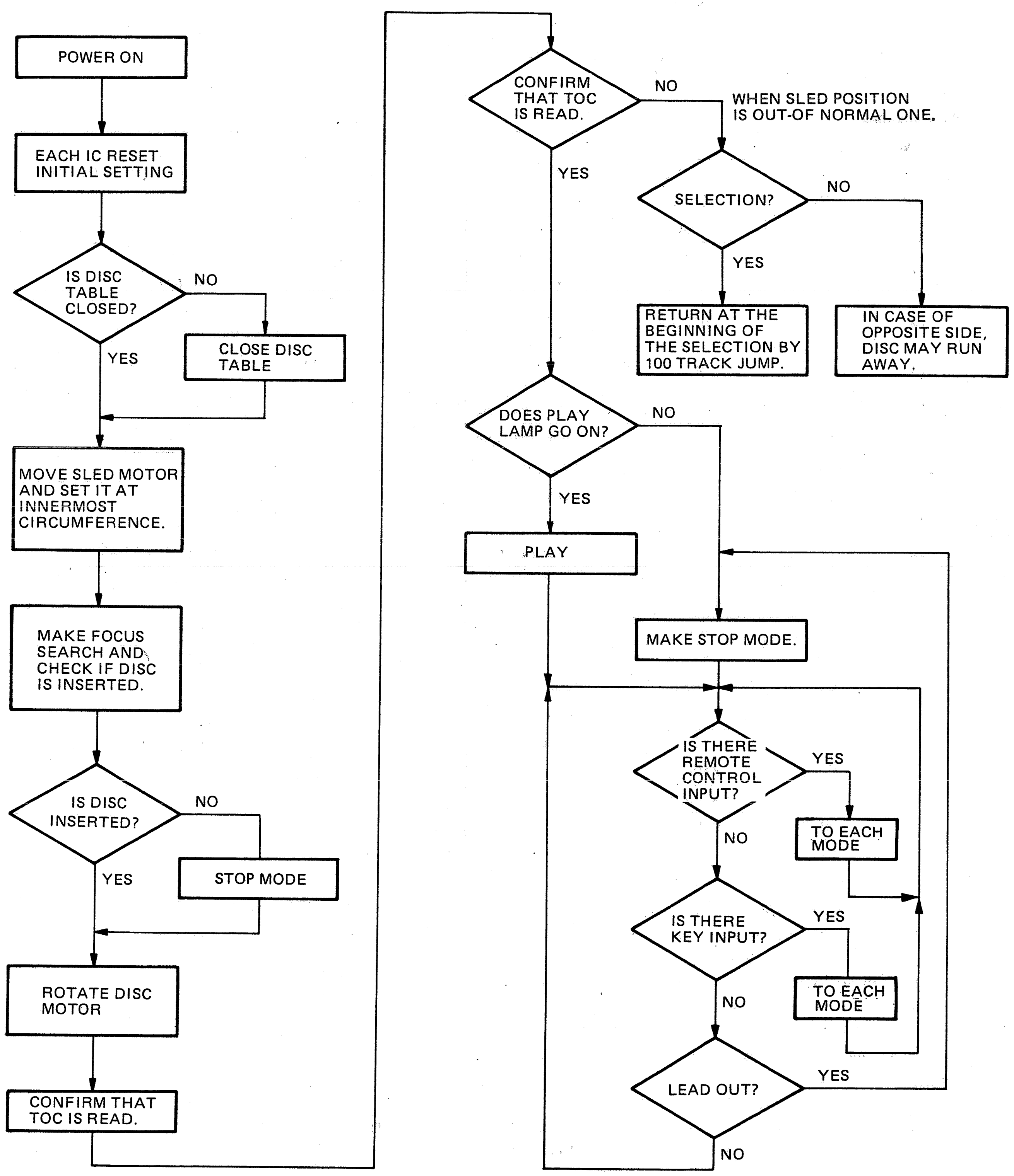
For example, if PLAY button is pressed from key input, master control (IC302) gives mechanical control IC (IC303) a command to make PLAY mode. When this command is given, mechanical control IC (IC303) works in routine operation to make PLAY mode. It gives every kind of commands for IC201, 307 and they are in PLAY mode.

Through IC201 and IC307 use common data bus, they distinguish a command for IC201 or IC307 by a higher rank 4 bit value of each command from mechanical control IC (IC303).

Command for IC201: higher rank 4 bit 0000-0011 (0-3 with sexadecimal number system) are used.

Command for IC307: higher rank 4 bit 1010-1110 (A-E with sexadecimal number system) are used. IC201 controls servo (focus, tracking, sled) mainly. IC307 checks EFM demodulation and CRC.

The illustration below shows flow chart of simple operation after power is ON.


POWER ON
EACH IC RESET INITIAL SETTING
IS DISC TABLE CLOSED?
NO
CLOSE DISC TABLE
YES
MOVE SLED MOTOR AND SET IT AT INNERMOST CIRCUMFERENCE.
MAKE FOCUS SEARCH AND CHECK IF DISC IS INSERTED.
IS DISC INSERTED?
NO
STOP MODE
YES
ROTATE DISC MOTOR
CONFIRM THAT TOC IS READ.
CONFIRM THAT TOC IS READ.
NO
WHEN SLED POSITION IS OUT-OF NORMAL ONE.
YES
SELECTION?
NO
YES
RETURN AT THE BEGINNING OF THE SELECTION BY 100 TRACK JUMP.
IN CASE OF OPPOSITE SIDE, DISC MAY RUN AWAY.
DOES PLAY LAMP GO ON?
NO
YES
PLAY
MAKE STOP MODE.
IS THERE REMOTE CONTROL INPUT?
YES
TO EACH MODE
NO
IS THERE KEY INPUT?
YES
TO EACH MODE
NO
LEAD OUT?
YES
NO

1-2. MASTER CONTROL IC (IC302)

Master control IC (IC302) controls all of the operations of this set. Besides inputting key input and remote control input and data from mechanism control IC (IC303), it outputs display output and commands to mechanism control IC303.

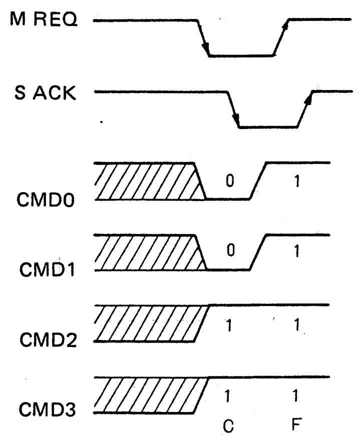
Pin Functions

Pin. No.	I/O	Pin Name	Operation
1–4	OUT	$\overline{\text{D0–D3}}$	Data output pin for key scan digit signal and to display tube drive IC (IC801)
5–8	IN	K0–K3	Key scan data input pin.
9	IN	OSC	Clock input pin.
11	IN	$\overline{\text{RESET}}$	Reset input pin. Goes high about 1.5 seconds after power on.
13	IN	$\overline{\text{Q INT}}$	Trigger input pin when data is transferred from IC303 to IC302.
14	IN	$\overline{\text{OUT SW}}$	Input pin, goes low when disc compartment opens. When this pin goes high, IC302 outputs load in command to IC303.
15	–	H. L.	When this pin is low, IC302 does not output load in command to IC303 even if pin 14 is high.
17	IN	$\overline{\text{REC M}}$	Syncro REC signal input pin.
18	IN	SI CLK	Clock input pin from remote control decoder.
19	IN	$\overline{\text{IN SW}}$	Input pin, goes low when disc compartment closes.
20	IN	SI DATA	Serial data input pin from remote control decoder.
21	–	GND	Ground
29	OUT	CD F	Direct function output pin. High is output for 600 msec when PLAY, PAUSE button is pressed during STOP mode.
30–33	IN/OUT	CMD0–CMD3	I/O pin for data with IC303.
34	OUT	M REQ	Control (request) signal output pin for commands to IC303.
35	IN	S ACK	IC303 acknowledge signal input pin.
36	OUT	RST	Reset output pin to display tube drive IC (IC810).
37	OUT	CTL	Clock output pin to display tube drive IC (IC801).
38	OUT	IDP	Output pin for data which controls display tube drive IC (IC801) characters.
39	OUT	RMS LED	RMS LED output pin.
40	OUT	PAUSE LED	PAUSE LED output pin.
41	OUT	PLAY LED	PLAY LED output pin.
42	OUT	VDD	Power supply pin (5 V)

When commands are sent from the master control IC (IC302) to the mechanism control IC, the master control IC sets the data to be sent and makes the M REQ pin go low from high, as shown in the figure. When the M REQ pin goes low, the mechanism control IC (IC303) makes the S ACK pin go low from high. At the time data is taken in to the mechanism control IC (IC303).

When the master control IC (IC302) confirms that the S ACK pin has gone low, it sets the next data and makes the M REQ pin high. When the M REQ pin goes high, the mechanism control IC (IC303) makes the S ACK pin high and reads in the data.

Example: CLOSE command. (CF)



Command from master control IC (IC302) to mechanism control IC (IC303).

Command		
OPEN	DF	Opens disc compartment.
CLOSE	CF	Closes disc compartment.
AMS	A * * 01F TRACK NO (* *)	Perform AMS. If for the 5th selection: A0501F
INDEX	A * * * * F TRACK NO (* *) INDEX NO (* *)	Perfroms index search. When the INDEX key is pressed, TRACK NO and INDEX NO are input and sent.
LOCATION	B * * * * * * * * * OF TRACK NO (* *) INDEX NO (* *) MIN (* *) SEC (* *) FRAME (*)	Performs A → B repeat. The place for A is memorized, that data is put into the * section and set out, the pick-up is returned to the place with that vavlue, and repeats play between that point and the point where B was pressed..
STOP	1F	Stops spindle motor and sled motor.
manual search	4F–9F	Sends out during FF and REW.
	4F	FF during PAUSE. Performs 40 track jump after a certain time passes.
	5F	REW during PAUSE.
	6F	FF Performs 10 track jump after a certain time passes.
	7F	REW
	8F, 9F	not used
PAUSE	3F	PAUSE
PLAY	2F	normal PLAY command
TOC REQ	* * * * * * * * * * (F) H (*) L (*) MIN (* *) SEC (* *) = Selection N; MIN (* *) SEC (* *) = Selection N + 1	This command is sent out when the TOC data in the mechanism control IC is desired, and is sent out during random access, when selection changes, etc.

The above signals are sent from CMD0-CMD3 to the mechanism control IC.

The mechanism control IC executes these commands.

Commands sent from the mechanism control IC (IC303) to the master control IC (IC302).

TOC, Q data	C * * * * * * * * * * * * * F TRACK NO (* *) INDEX NO (* *) MIN (* *) SEC (* *) FRAME (*) MIN (* *) SEC (* *) MIN SEC: elapsed time in the track; MIN SEC: elapsed time from beginning of disc	TOC data or Q data is sent.
TOC READ END	A (F)	Sent out when TOC data read-in is finished.
LEAD OUT	B (F)	Sent out when disc ends.
NO DISC	E (F)	Sent out when there is no disc in the disc compartment.
OPEN	D (F)	Sent out when the disc compartment is open.

The mechanism control IC (IC303) keeps the TOC data and Q data read in from the disc, and sends it to the master control IC (IC302) as required.

1-3. MECHANISM CONTROL IC (IC303)

Mechanism control IC303 sends commands to IC201 (servo IC CX20108) and IC307 (digital processing/CLV servo IC CX23035) via the DATA, CLOCK and LATCH pins, and also memorizes TOC and Q data, and performs direct search, etc. based on this data.

Pin Functions

Pin No.	I/O	Pin Name	Operation
1	OUT	REC MUTE	Synchro REC MUTE signal output pin.
2	OUT	PAUSE	Synchro PAUSE release signal output pin.
3	IN	$\overline{\text{REC M}}$	Synchro REC signal input pin.
4	–	$\overline{\text{ADJ}}$	By making this pin low, IC303 will not load the disc out even if servo or other abnormalities are detected. Used for servo and PLL adjustment.
5	OUT	MUTE	Muting control output pin.
6	–	$\overline{\text{JMP}}$	By making this pin low, direct search is not performed and access is done by track jump. Used for track jump check.
9	IN	OSC	Clock input pin.
11	IN	$\overline{\text{RESET}}$	Reset input pin. Goes high about 1.5 seconds after power on.
13	IN	SCOR	SUB Q sync signal input pin.
15	IN	$\overline{\text{IN SW}}$	Input pin; goes low when disc compartment closes.
16	IN	$\overline{\text{OUT SW}}$	Input pin; goes low when disc compartment opens.
17	IN	$\overline{\text{FOK}}$	Focus OK signal input pin.
18	IN	WFCK	WFCK (Write Frame Clock) input pin.
19	IN	GFS	Guard Frame Sync input pin. High is input when disc data can be read in normally.
20	IN	SUB Q	SUB Q signal (selection address, emphasis data, etc.) input pin.
21	–	GND	Ground
22	IN	SENSE	IC201, IC301 SENS output input pin.
23	IN	Q CHECK	Input pin for SUB Q CRC results output from IC307.
24	OUT	LATCH	Latch output pin for serial data to IC201, 307.
25	OUT	$\overline{\text{DIRECT}}$	Output pin to IC201 during track jump. Normally high, reverses track jump pulse direction at low. Next, for high set to normal tracking mode. Outputs low for a set time at detection of TZC rise and fall.
26	OUT	DATA	Serial data output pin to IC201, 307.
27	OUT	CLOCK	Serial data transmission clock output pin to IC201, 307.
28	OUT	$\overline{\text{SLED G}}$	Output pin; controls sled motor gain. Normally high. Low during access.
29	IN	SLED S	Low when sled motor operates. Inputs high when it stops.
31	OUT	Q INT	Trigger output pin for data sent to IC302.
32	OUT	S ACK	Acknowledge signal output pin for IC302 M REQ signal.
33	IN	M REQ	IC302 M REQ signal input pin.
34–37	IN/OUT	CMD0–CMD3	I/O pin with IC302 data.
38	OUT	LD ON	Output pin; controls laser diode ON/OFF.
39	OUT	LOAD IN	Output pin; drives loading motor to the close side.
40	OUT	LOAD OUT	Output pin; dirves loading motor to the open side.
41	OUT	EPS	Detects disc emphasis, switches emphasis ON/OFF. Output pin.
42	–	VDD	Power supply pin (5 V)

The Q data called SUB Q is used for the TOC Table of Contents) data in the lead-in area, mode control signals such as preemphasis during the selections, and track number (TNO), index number, play time, etc. display and address data.

This data is input to mechanism control IC (IC303) SUB Q pin from IC307, and is written into the RAM by 8 bit units. Data is sent from the mechanism control IC (IC303) to the master control IC (IC302) as required, and is displayed. Data is sent from the mechanism control IC to the master control IC about 8 times in 1 second.

1-4. DIRECT SEARCH

On this set, a linear motor is used for the sled motor, so that besides 100, 10 and 1 track jump, the optical pick-up can be moved directly to the address specified by the microcomputer. (direct search). (On the conventional CD player, only the objective lens moves, and the optical pick-up follows it by servo in order to perform 100, 10 and 1 track jump only.) Higher performance access is enabled on this set.

On the convertional CD player, only three data, A0 (MNR of first selection on the disc), A1 (MNR of last selection on the disc) and A2 (leadout track start point) were memorized when TOC data was read in to the microcomputer. However, on this model, the absolute time from the first to the 21st selection is memorized in the microcomputer. This absolute time is converted to track numbers inside the microcomputer, and the track number to be jumped is obtained by subtracting the current address track number from the track number of the selection to be jumped to.

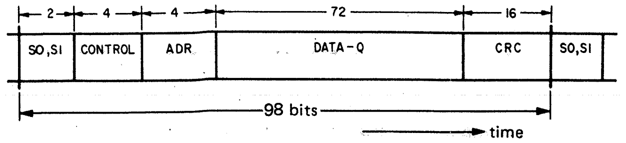
Frame number	POINT	PMIN, PSEC, RFRAME
n	01	00, 02, 32
n + 1	01	00, 02, 32
n + 2	01	00, 02, 32
n + 3	02	10, 15, 12
n + 4	02	10, 15, 12
n + 5	02	10, 15, 12
n + 6	03	16, 28, 63
n + 7	03	16, 28, 63
n + 8	03	16, 28, 63
n + 9	04	• •
n + 10	04	• •
n + 11	04	• •
n + 12	05	• •
n + 13	05	• •
n + 14	05	• •
n + 15	06	49, 10, 03
n + 16	06	49, 10, 03
n + 17	06	49, 10, 03
n + 18	A0	01, 00, 00
n + 19	A0	01, 00, 00
n + 20	A0	01, 00, 00
n + 21	A1	06, 00, 00
n + 22	A1	06, 00, 00
n + 23	A1	06, 00, 00
n + 24	A2	52, 48, 41
n + 25	A2	52, 48, 41
n + 26	A2	52, 48, 41
n + 27	01	00, 02, 32 ↓ repeat
n + 28	01	00, 03, 32
•	•	• •
•	•	• •
•	•	• •

- Frame number: 98 symbol, 1 block No.
- POINT = For A0, PMIN indicates MNR of first selection on the disc. PSEC, PFRAME are "00".
- POINT = For A1, PMIN indicates MNR of last selection on the disc. PSEC, PFRAME are "00".
- POINT = For A2, PSEC, PFRAME indicate lead-out track start point.
- POINT = For 01–06, PMIN, PSEC indicate the absolute time of the selection.

Table A. TOC Structure (Example of a 6 selection disc)

Direct search is performed as follows:

When the search command is input to the mechanism control to (IC303) from the master control IC (IC302) due to key input or remote control input, the mechanism control IC303 converts the current address to track number from the data Q of the current address channel Q (Figure 1) data. (This data Q is always input from pin 20 SUB Q during play.) The address to be jumped to is also converted to a track number, the track numbers are compared, and the number of tracks to be jumped is calculated.


2
4
4
72
16
SO,SI
CONTROL
ADR
DATA-Q
CRC
SO,SI
98 bits
time

SO, S1: parts of sync pattern.
CONTROL: Indicates channel number and preemphasis ON/OFF.
Output from MSB
0000 – 2CH, no pre-emphasis
1000 – 4CH, no pre-emphasis
0001 – 2CH, pre-emphasis
1001 – 4CH, pre-emphasis
LSB = 0 at lead-in and lead-out portions.
ADR: Control bit for DATA-Q. Output from MSB.
DATA-Q: 72 bits of data; output from MSB.
CRC: CRC for CONTROL, ADR, DATA-Q. Refer to PCM-F1 Operation Manual for details on CRC.
Output from MSB.
Generation multinominal is
$P(x) = X^{16} + X^{12} + X^{5} + 1$

Figure 1. Channel Q Structure

– Data Form on Lead-in Track (indicate TOC) –

MNR (00)	POINT	MIN	SEC	FRAME	ZERO	PMIN	PSEC	PFRAME
8	8	8	8	8	8	8	8	8

72 bits
data-Q

– Data Form of Music Signal and Lead-out Track –

MNR	X	MIN	SEC	FRAME	ZERO	AMIN	ASEC	AFRAME
8	8	8	8	8	8	8	8	8

72 bits
data-Q

MNR: Expresses Music Number as 2 digits of BCD.
00 → Lead-in track
01-99 → Music number
AA → Lead-out track
X: MNR index, expressed as 2 digits of BCD.
1 MNR is divided into 100. The method of division is determined by the software, and numbering is in order from "00-99". Does not exist on lead-in track.
00 → Pause encoding
Applies pause. There is 2-3 seconds of pause encoding at the top of the selection.
01-99 → Sub-division number.
X = 01 on the lead-out track, MNR = 01-99 and X ≒ 00 during a selection. Initial value is "01", then increases by ones.
ZERO: All these 8 bits are "0".
MIN, SEC, FRAME: Selection running time is expressed by BCD 6 digits. All "0" at beginning of selection. Time increases during the selection, stops at pause. Become "0" at end of pause. Time increases on lead-in and lead-out tracks. 1MIN = 60 SEC, 1SEC = 75 FRAME (00-74)
AMIN, ASEC, AFRAME: Disc running time is expressed as BCD 6 digits. At start of disc program area, time is "0" and MNR is the first value of that disc.
1AMIN = 60 ASEC, 1ASEC = 75 AFRAME (00-74)
POINT, PMIN, PSEC, PFRAME: Disc table of contents is on this part of the lead-in track. As shown in the table, it is recorded continuously and repeatedly on the lead-in track, or MNR = 00 portion. Also, each content is recorded 3 times each.
PMIN, PSEC, PFRAME values each express selection start point. There is ±1 second precision on AMIN, ASEC, AFRAME time axes.

Figure 2. Data Q Structure

Next, the mechanism control IC puts the digital signal processing/CLV servo IC (IC307) CX23035 into counter set mode. By doing this, CX23035 outputs the CNIN pin ⑰ input signal CNIN/2h (Hz) signal from SENSE pin ⑱(COUNT). At this time 41 is set in n, so a signal which is the input signal divided by 82 is output from the SENSE pin.

Then tracking and sled servo go off, focus servo goes on and the optical pick-up is moved quickly by the linear (sled) motor. When this happens the RF amp (IC201) CX20109 MIRR pin ⑱ mirror output is as shown in Figure 3. (For example, if there are 20000 tracks from the innermost to outermost circumference, and access is done in 0.5 seconds, mirror output is 40 kHz, which is too fast for the mechanism control IC to read.)

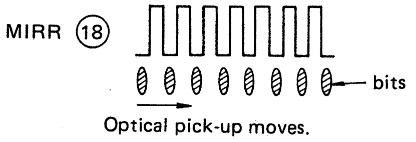

MIRR ⑱
bits
Optical pick-up moves.

Figure 3. Mirror Output for Direct Search

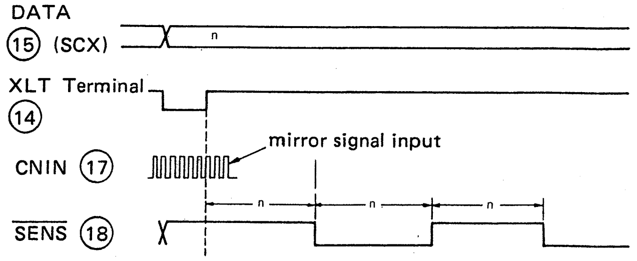
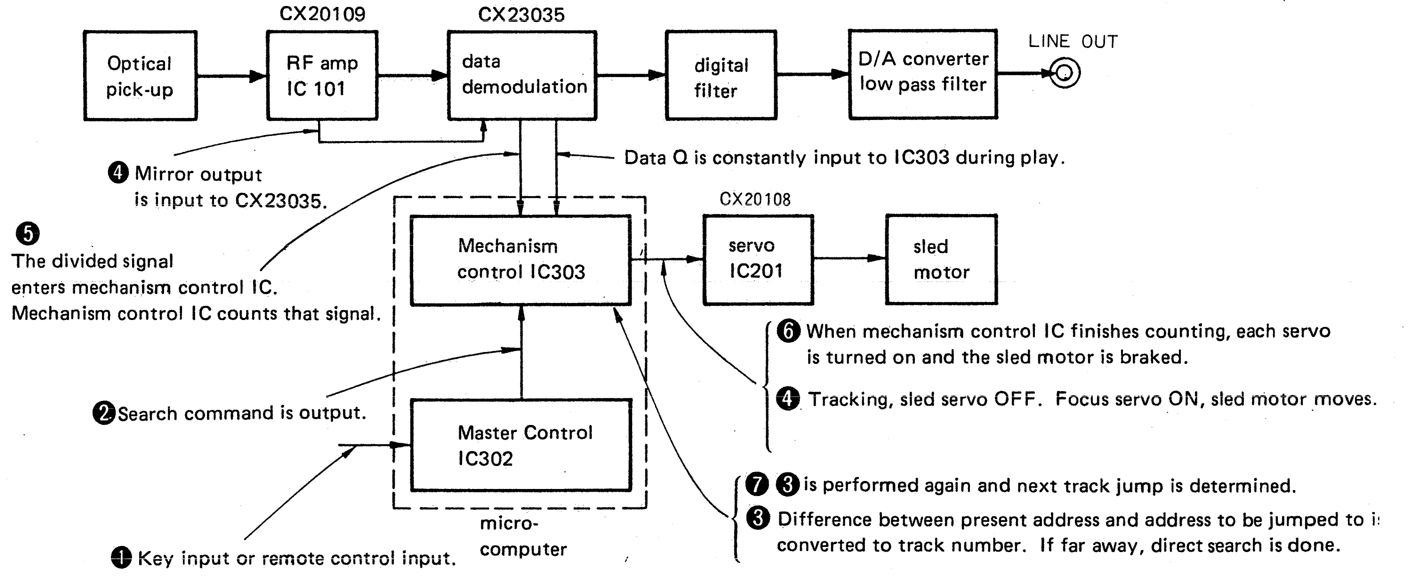

DATA
⑮ (SCX)
n
XLT Terminal
⑭
mirror signal input
CNIN ⑰
n
n
n
SENS ⑱

Figure 4. Count Signal Timing

This mirror output is input to CX23035 CNIN pin ⑰, then is divided into 41 and output from SENSE pin ⑱ to the mechanism control IC SENS pin ㉒. (At this time, it is divided and can be read.) This input signal is counted by the mechanism control IC at rise or fall and is converted to the number of tracks to be jumped. For example, for a 1000 track jump, consecutive cmparison, such as 1000/82≒12 is done and when that value is reached, each servo is turned on and the optical pick-up is braked. Then DATA-Q is read, converted to track number, and if within a certain range, 100, 10, 1 track jump are performed and convergence is done. Outside of that range, direct search is performed again.


CX20109
CX23035
Optical pick-up
RF amp IC 101
data demodulation
digital filter
D/A converter low pass filter
LINE OUT
❹ Mirror output is input to CX23035.
Data Q is constantly input to IC303 during play.
CX20108
❺ The divided signal enters mechanism control IC. Mechanism control IC counts that signal.
Mechanism control IC303
servo IC201
sled motor
❻ When mechanism control IC finishes counting, each servo is turned on and the sled motor is braked.
❹ Tracking, sled servo OFF. Focus servo ON, sled motor moves.
❷ Search command is output.
Master Control IC302
❼ ❸ is performed again and next track jump is determined.
❸ Difference between present address and address to be jumped to i
converted to track number. If far away, direct search is done.
micro-computer
❶ Key input or remote control input.

1-5. LINEAR MOTOR AND SERVO CIRCUITS

A linear motor is used for optical pick-up transportation mechanism on this model.

Figure a shows the optical pick-up transportation mechanism. The linear motor drive coil (sled coil) is part of the optical pick-up and performs transportation operation. There is a sensor coil mounted on the opposite side of the linear motor. This detects when the optical pick-up reaches the innermost circumference and stops the linear motor.

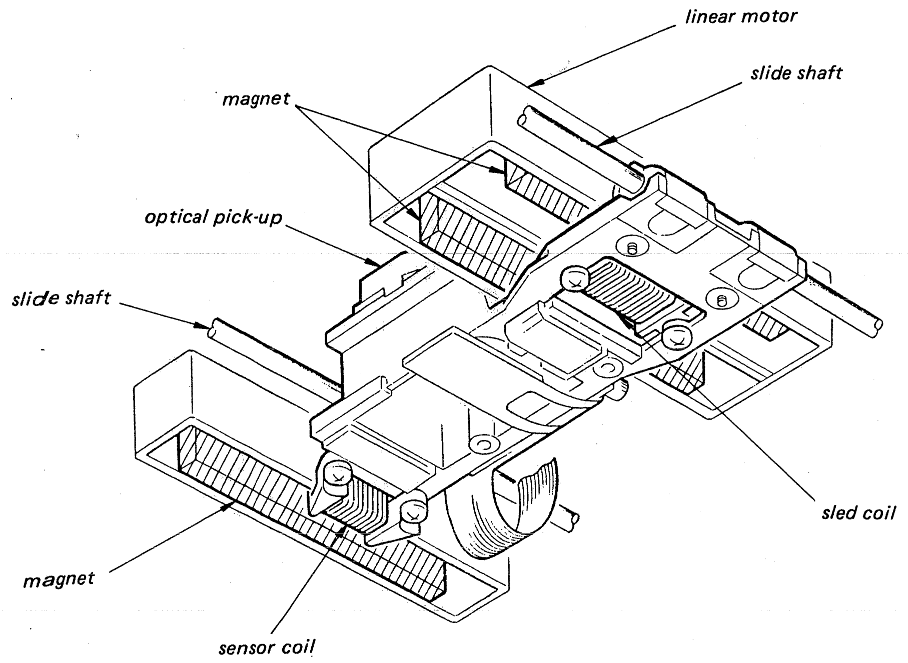

linear motor
slide shaft
magnet
optical pick-up
slide shaft
sled coil
magnet
sensor coil

Figure a. Optical Pick-up Transportation Mechanism

The linear motor is structured with a coil wound around a yoke plate and a magnet at both ends. Figure b shows the theory of operation. The coil receives force in the direction of Ⓐ when current flows to the coil in the magnetic field.

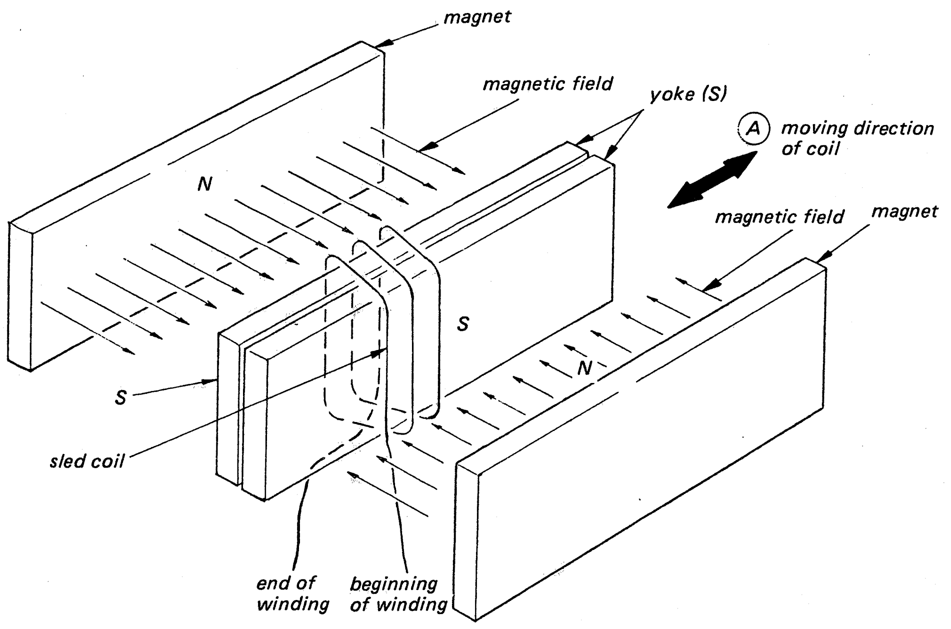
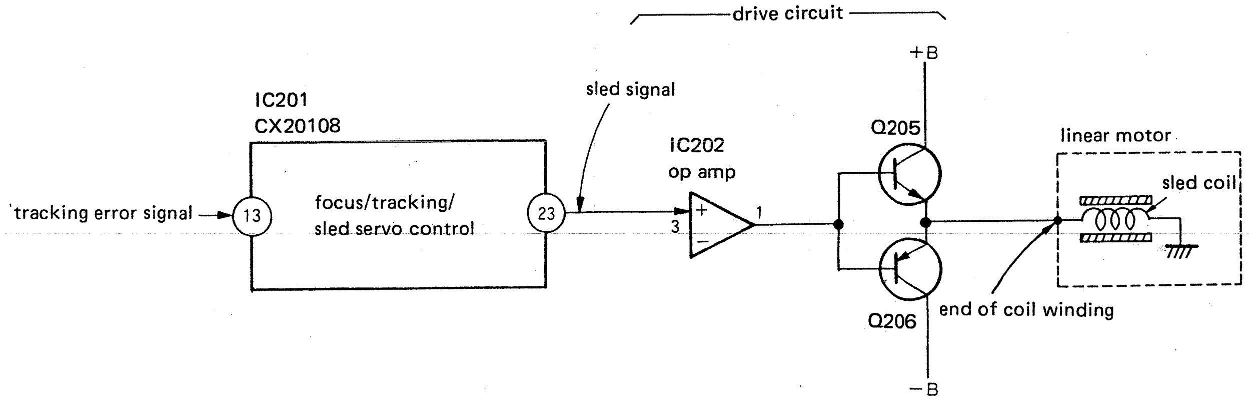

magnet
magnetic field
yoke (S)
Ⓐ moving direction of coil
N
magnetic field
magnet
S
S
N
sled coil
end of winding
beginning of winding

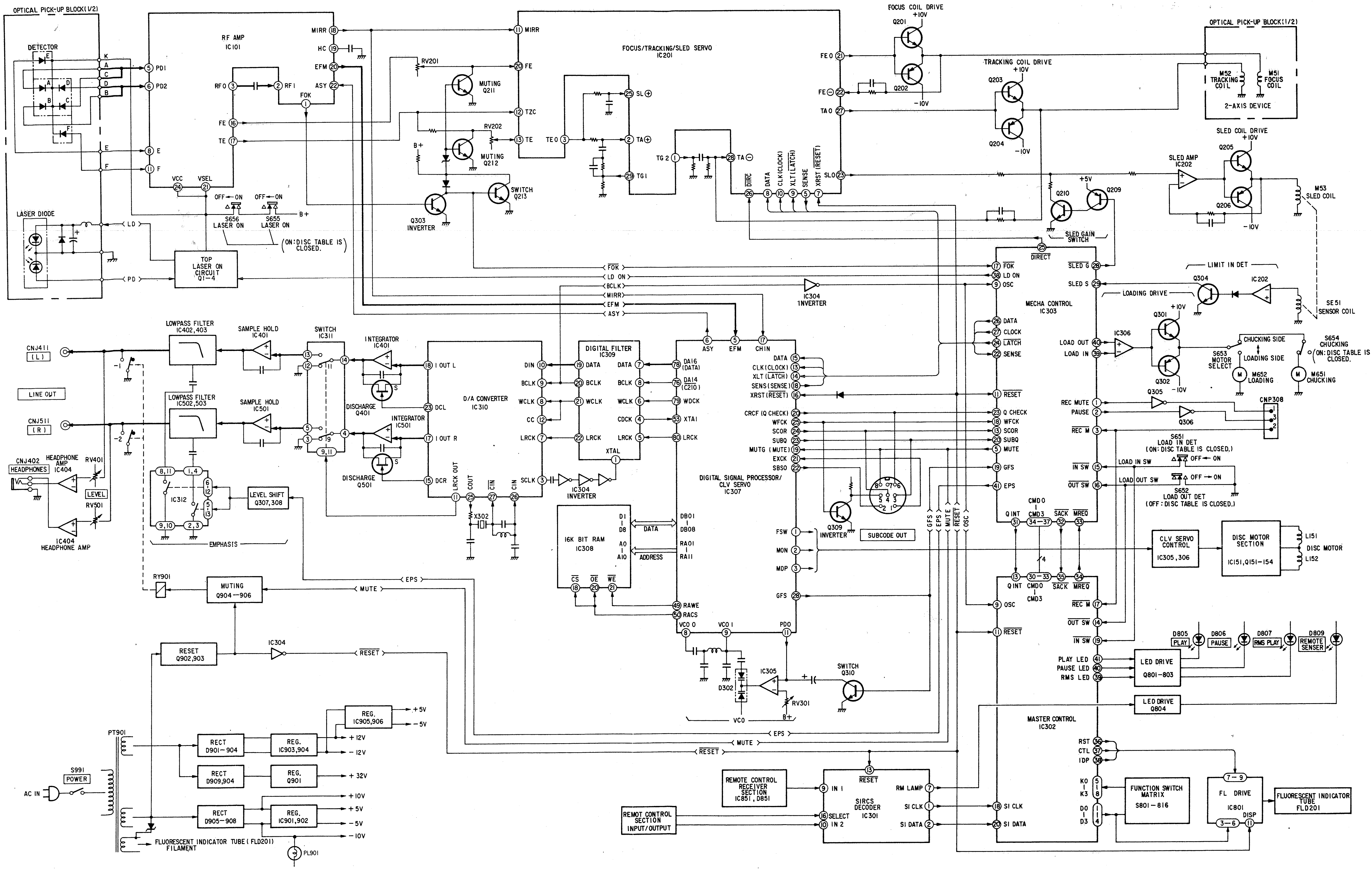
Figure b. Theory of Linear Motor Operation

The linear motor servo circuit receives a tracking error signal at CX20108 (IC201) servo control in order to prevent the optical pick-up laser spot from leaving the pit track, and outputs a sled signal. This sled signal drive controls the linear motor. Also, to perform 1, 10, 100 track jump, the signal from IC303 (mechanism control) is controlled at IC201 (CX20108) and the linear motor is driven by the sled signal. This allows 1, 10, 100 track jump to be performed smoothly.


drive circuit
+B
sled signal
IC201
CX20108
IC202
op amp
Q205
linear motor
sled coil
tracking error signal
13
focus/tracking/
sled servo control
23
+
3
−
1
Q206
end of coil winding
−B

Linear Motor Servo Circuit Structure

SECTION 2
BLOCK DIAGRAM


OPTICAL PICK-UP BLOCK(1/2)
DETECTOR
LASER DIODE
RF AMP
IC101
PD1
PD2
RFO
RF I
FE
TE
VCC
VSEL
FOK
MIRR
HC
EFM
ASY
S656
LASER ON
S655
LASER ON
OFF ← ON
(ON: DISC TABLE IS CLOSED.)
TOP LASER ON CIRCUIT
Q1-4
LD
PD
RV201
MUTING
Q211
RV202
MUTING
Q212
SWITCH
Q213
Q303
INVERTER
FOCUS/TRACKING/SLED SERVO
IC201
TZC
TEO
SL⊕
TA⊕
TA⊖
TG2
TG1
DIRC
DATA
CLK(CLOCK)
XLT(LATCH)
SENSE
XRST(RESET)
FEO
FE⊖
TAO
SLO
FOCUS COIL DRIVE
Q201
Q202
+10V
-10V
TRACKING COIL DRIVE
Q203
Q204
OPTICAL PICK-UP BLOCK(1/2)
M52
TRACKING COIL
M51
FOCUS COIL
2-AXIS DEVICE
SLED COIL DRIVE
SLED AMP
IC202
Q205
Q206
M53
SLED COIL
Q210
Q209
+5V
SLED GAIN SWITCH
DIRECT
LIMIT IN DET
Q304
IC202
SE51
SENSOR COIL
LOADING DRIVE
BCLK
LD ON
IC304
INVERTER
MECHA CONTROL
IC303
SLED G
SLED S
OSC
CLOCK
LATCH
RESET
Q CHECK
WFCK
SCOR
SUBQ
MUTE
GFS
EPS
LOAD OUT
LOAD IN
IC306
Q301
Q302
CHUCKING SIDE
LOADING SIDE
S653
MOTOR SELECT
M652
LOADING
M651
CHUCKING
S654
CHUCKING
(ON: DISC TABLE IS CLOSED.)
REC MUTE
PAUSE
REC M
Q305
Q306
CNP308
S651
LOAD IN DET
(ON: DISC TABLE IS CLOSED.)
IN SW
OUT SW
S652
LOAD OUT DET
(OFF: DISC TABLE IS CLOSED.)
LOAD IN SW
LOAD OUT SW
CMD0
QINT
CMD3
SACK
MREQ
CLV SERVO CONTROL
IC305, 306
DISC MOTOR SECTION
IC151, Q151-154
L151
DISC MOTOR
L152
LOWPASS FILTER
IC402, 403
SAMPLE HOLD
IC401
SWITCH
IC311
INTEGRATOR
IC401
DISCHARGE
Q401
LOWPASS FILTER
IC502, 503
SAMPLE HOLD
IC501
INTEGRATOR
IC501
DISCHARGE
Q501
CNJ411
(L)
CNJ511
(R)
LINE OUT
CNJ402
HEADPHONES
HEADPHONE AMP
IC404
RV401
LEVEL
RV501
IC404
HEADPHONE AMP
IC312
EMPHASIS
LEVEL SHIFT
Q307, 308
D/A CONVERTER
IC310
I OUT L
I OUT R
DCL
DCR
LRCK OUT
COUT
CIN
SCLK
X302
DIN
WCLK
CC
LRCK
DIGITAL FILTER
IC309
XTAL
IC304
INVERTER
DIGITAL SIGNAL PROCESSOR/
CLV SERVO
IC307
ASY
EFM
CHIN
DA16 (DATA)
DA14 (C210)
WDCK
XTAI
CDCK
CRCF (Q CHECK)
SCOR
SUBQ
MUTG (MUTE)
EXCK
SBSO
FSW
MON
MDP
GFS
RAWE
RACS
VCO O
VCO I
PDO
16K BIT RAM
IC308
DI-D8
DB01-DB08
A0-A10
RA01-RA11
DATA
ADDRESS
CS
OE
WE
Q309
INVERTER
SUBCODE OUT
IC305
D302
RV301
SWITCH
Q310
VCO
RY901
MUTING
Q904-906
EPS
MUTE
RESET
Q902, 903
IC304
RESET
REG.
IC905, 906
+5V
-5V
RECT
D901-904
REG.
IC903, 904
+12V
-12V
RECT
D909, 904
REG.
Q901
+32V
RECT
D905-908
REG.
IC901, 902
+10V
+5V
-5V
-10V
PT901
S991
POWER
AC IN
FLUORESCENT INDICATOR TUBE (FLD201)
FILAMENT
PL901
REMOTE CONTROL RECEIVER SECTION
IC851, D851
REMOT CONTROL SECTION
INPUT/OUTPUT
SIRCS DECODER
IC301
IN 1
IN 2
SELECT
RM LAMP
SI CLK
SI DATA
MASTER CONTROL
IC302
RST
CTL
IDP
K0-K3
D0-D3
PLAY LED
PAUSE LED
RMS LED
LED DRIVE
Q801-803
LED DRIVE
Q804
D805
PLAY
D806
PAUSE
D807
RMS PLAY
D809
REMOTE SENSER
FUNCTION SWITCH MATRIX
S801-816
FL DRIVE
IC801
DISP
FLUORESCENT INDICATOR TUBE
FLD201

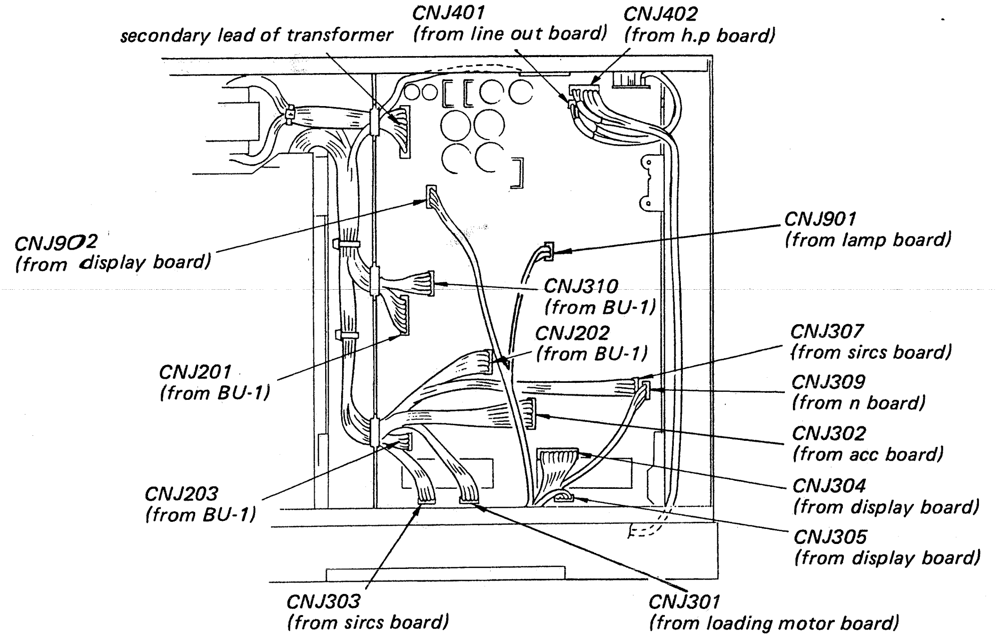
SECTION 3
DISASSEMBLY

3-1. DISASSEMBLY

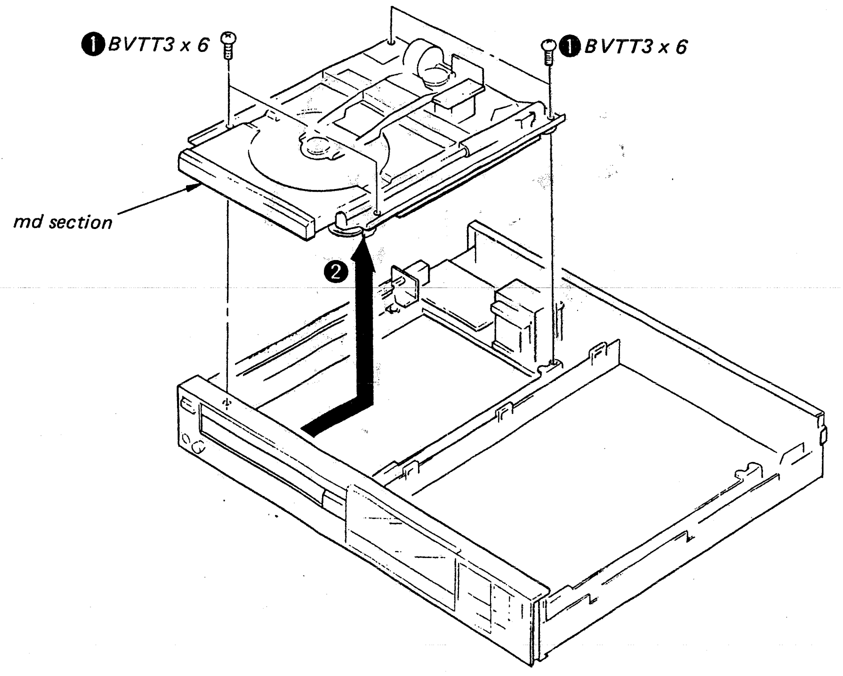
Note: Follow the disassembly procedure in the numerical order given.

- Remove case by taking out seven screws:
  both sides, 4 pcs.
  rear side, 3 pcs.

MAIN BOARD CONNECTOR LAYOUTS

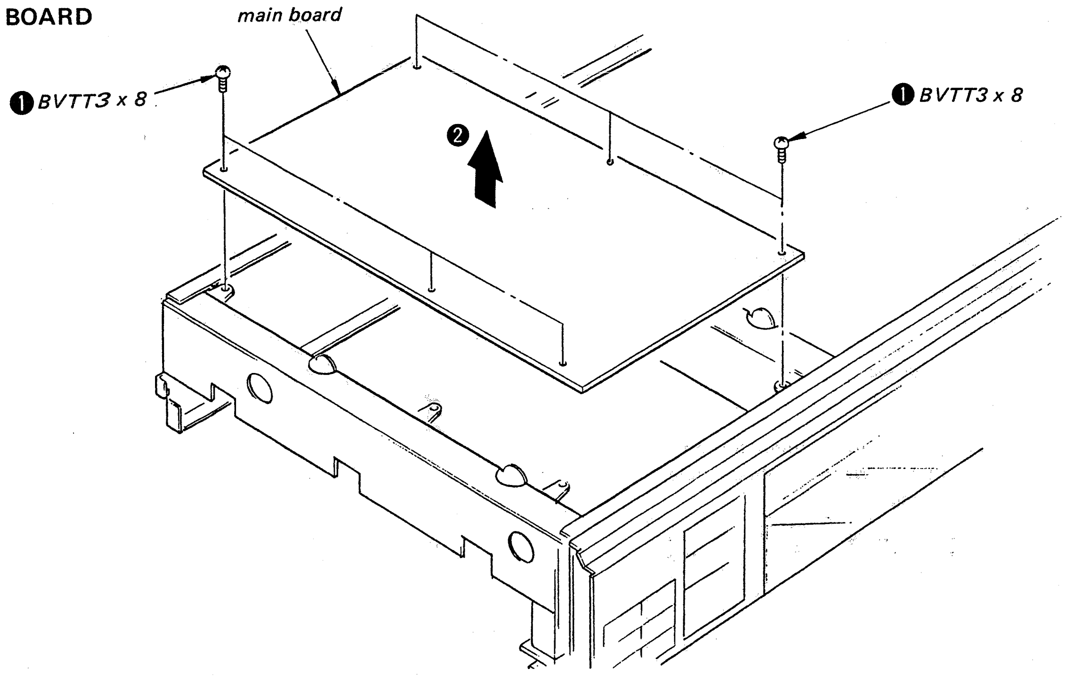

secondary lead of transformer
CNJ401 (from line out board)
CNJ402 (from h.p board)
CNJ902 (from display board)
CNJ901 (from lamp board)
CNJ310 (from BU-1)
CNJ202 (from BU-1)
CNJ201 (from BU-1)
CNJ307 (from sircs board)
CNJ309 (from n board)
CNJ302 (from acc board)
CNJ203 (from BU-1)
CNJ304 (from display board)
CNJ305 (from display board)
CNJ303 (from sircs board)
CNJ301 (from loading motor board)

MD SECTION

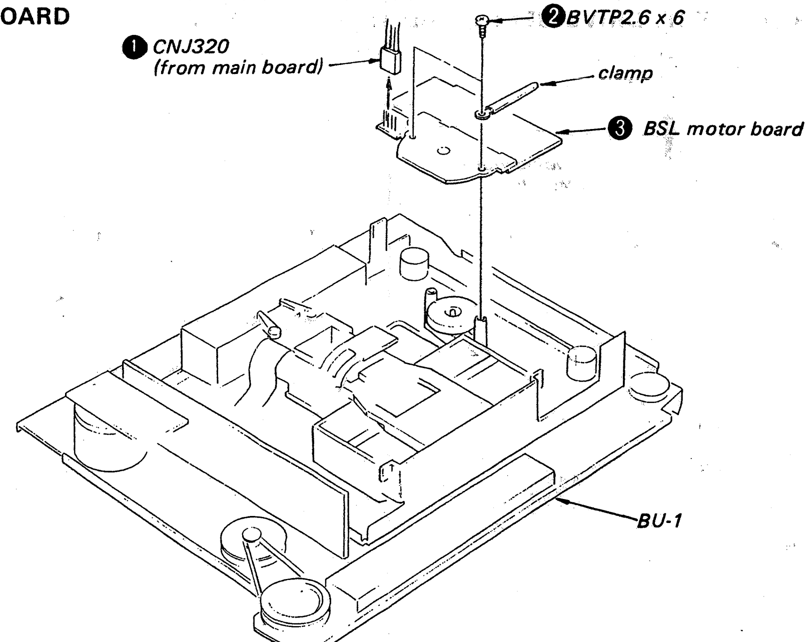

❶ BVTT3 x 6
❶ BVTT3 x 6
md section
❷

- Remove bottom plate.
  (BVTT3 x 8 8 pcs.)

MAIN BOARD

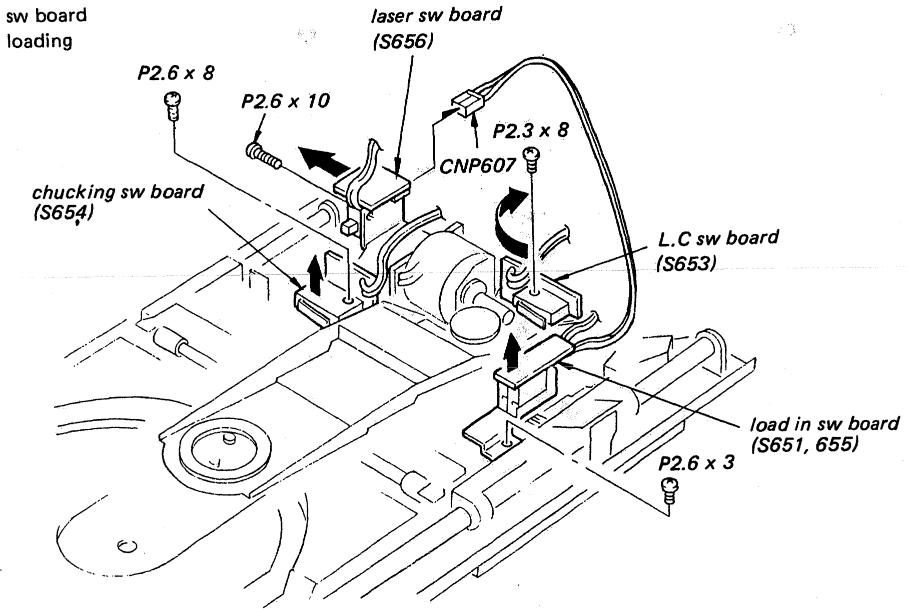

main board
❶ BVTT3 x 8
❶ BVTT3 x 8
❷

BSL MOTOR BOARD

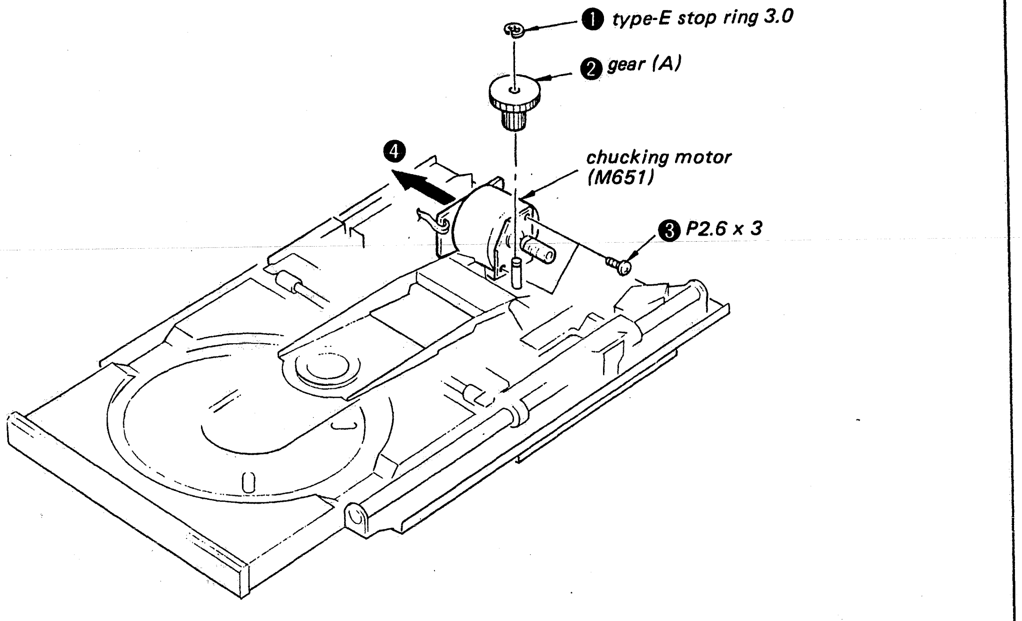

❶ CNJ320 (from main board)
❷ BVTP2.6 x 6
clamp
❸ BSL motor board
BU-1

SWITCH BOARDS

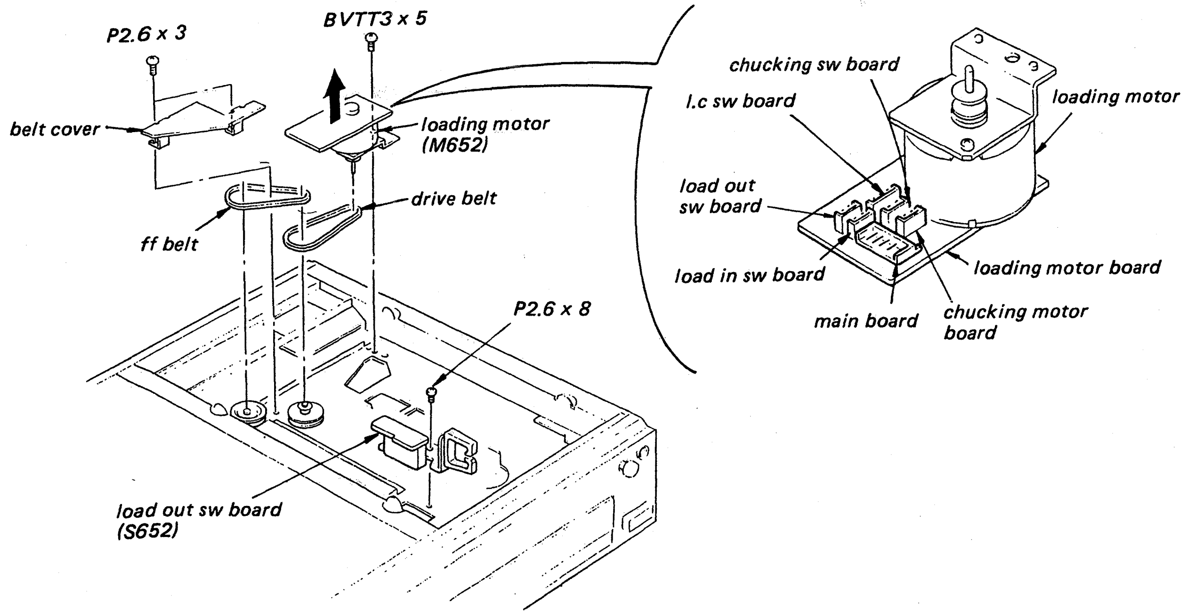
- All wires of each sw board are connected to loading motor board.


laser sw board
(S656)
P2.6 x 8
P2.6 x 10
P2.3 x 8
CNP607
chucking sw board
(S654)
L.C sw board
(S653)
load in sw board
(S651, 655)
P2.6 x 3

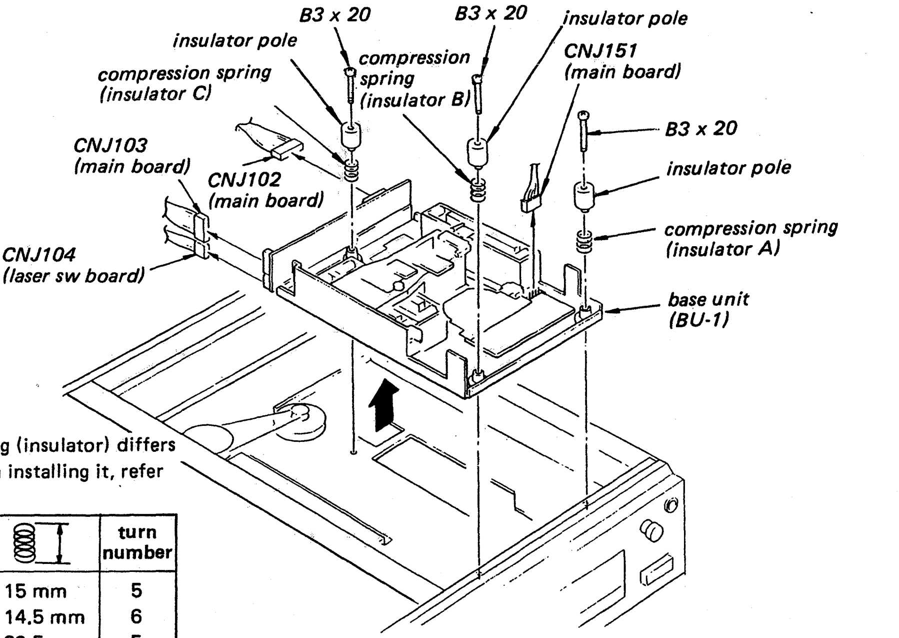
CHUCKING MOTOR (M651)


❶ type-E stop ring 3.0
❷ gear (A)
❹
chucking motor
(M651)
❸ P2.6 x 3

LOADING MOTOR, FF BELT, DRIVE BELT, LOAD OUT SW BOARD


P2.6 x 3
BVTT3 x 5
belt cover
loading motor
(M652)
drive belt
ff belt
P2.6 x 8
load out sw board
(S652)
chucking sw board
l.c sw board
loading motor
load out
sw board
load in sw board
loading motor board
main board
chucking motor
board

BASE UNIT (BU-1)


B3 x 20
B3 x 20
insulator pole
insulator pole
compression
spring
(insulator B)
CNJ151
(main board)
compression spring
(insulator C)
CNJ103
(main board)
CNJ102
(main board)
B3 x 20
insulator pole
compression spring
(insulator A)
CNJ104
(laser sw board)
base unit
(BU-1)

Note (1): When replacing BU-1, refer to "NOTES ON HANDLING BASE UNIT (BU-1)" on page 5 to prevent damage caused by static electricity.

Note (2): Each compression spring (insulator) differs in size and turns. When installing it, refer to the following list.

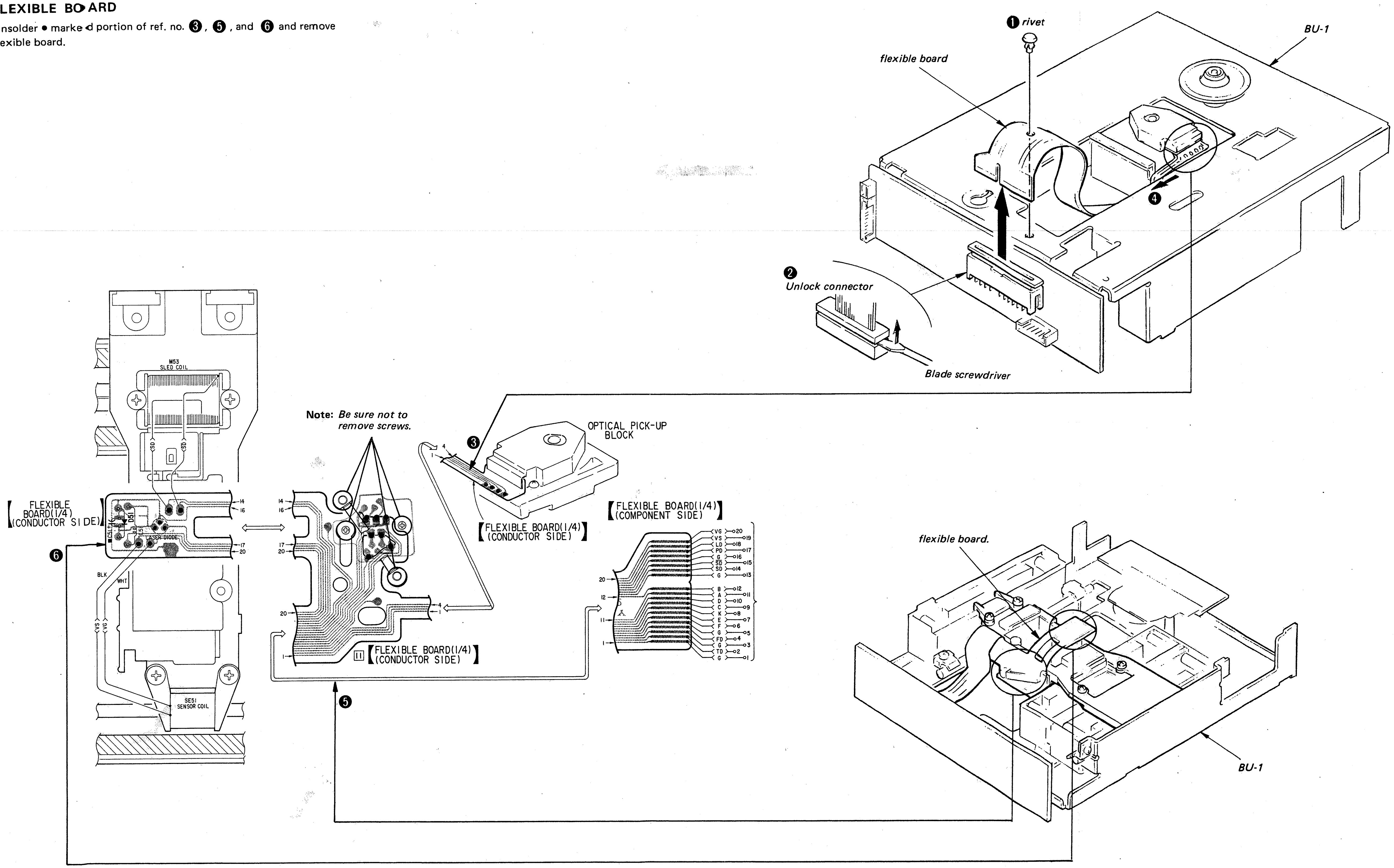
compression spring (insulator)		turn number
A	15 mm	5
B	14.5 mm	6
C	20.5 mm	5

Refer to "NOTES ON HANDLING BU-1 (BASE UNIT)" on page 5 to prevent damage caused by static electricity.

Refer to "NOTES ON HANDLING BU-1 (BASE UNIT)" on page 5 to prevent damage caused by static electricity.

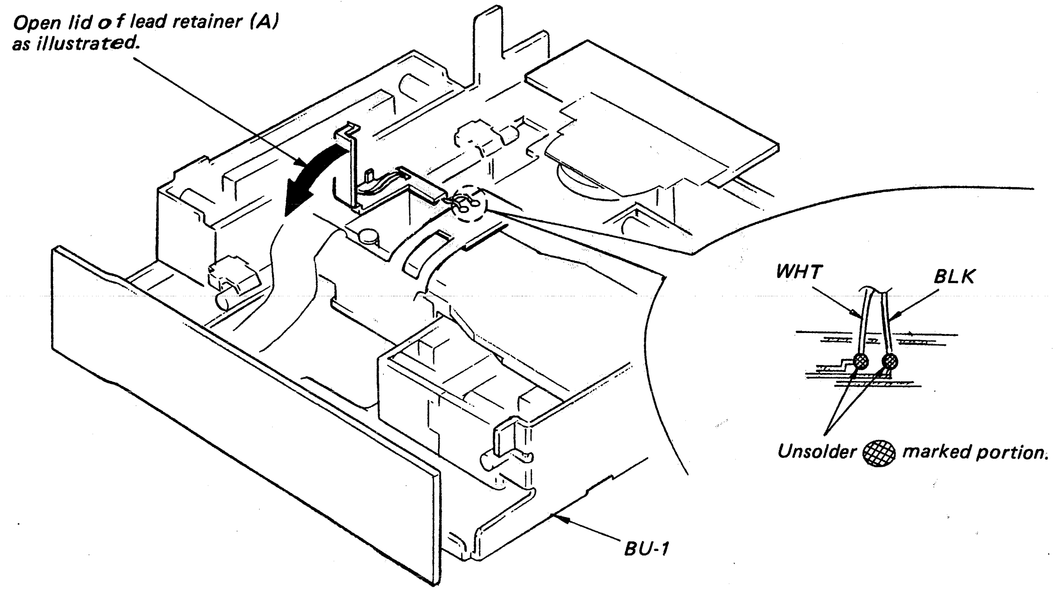
FLEXIBLE BOARD

Unsolder ● marked portion of ref. no. ❸, ❺, and ❻ and remove flexible board.

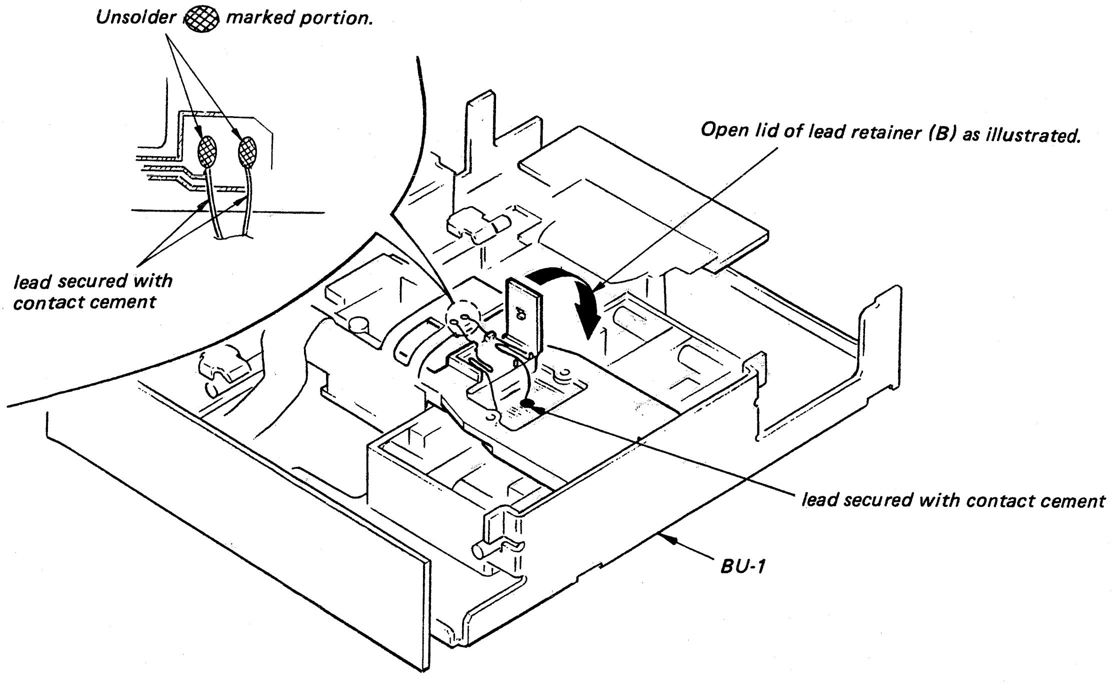

❶ rivet
BU-1
flexible board
❹
❷
Unlock connector
Blade screwdriver
M53
SLED COIL
SD
SD
FLEXIBLE BOARD(1/4) (CONDUCTOR SIDE)
LASER DIODE
D51
14
16
17
20
❻
BLK
WHT
VS
VG
SE51
SENSOR COIL
Note: Be sure not to remove screws.
OPTICAL PICK-UP BLOCK
❸
4
1
FLEXIBLE BOARD(1/4) (CONDUCTOR SIDE)
FLEXIBLE BOARD(1/4) (CONDUCTOR SIDE)
FLEXIBLE BOARD(1/4) (COMPONENT SIDE)
VG 20
VS 19
LD 18
PD 17
G 16
SD 15
SD 14
G 13
B 12
A 11
D 10
C 9
K 8
E 7
F 6
G 5
FD 4
G 3
TD 2
G 1
20
12
11
1
❺
flexible board.
BU-1

Refer to "NOTES ON HANDLING BU-1 (BASE UNIT)" on page 5 to prevent damage caused by static electricity.

SLED/SENSOR COIL (1)


Open lid of lead retainer (A) as illustrated.

Unsolder ▨ marked portion.


Unsolder ▨ marked portion.

lead secured with contact cement

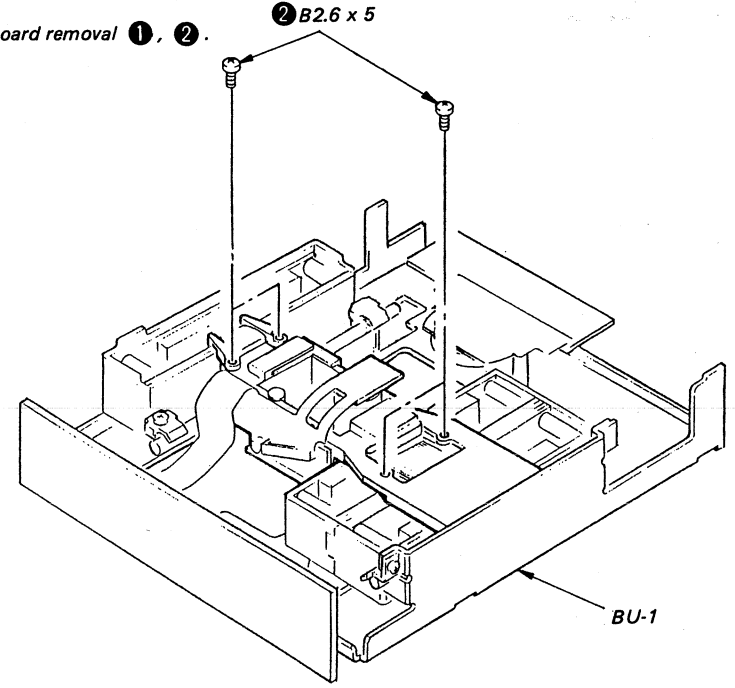
Open lid of lead retainer (B) as illustrated.

lead secured with contact cement

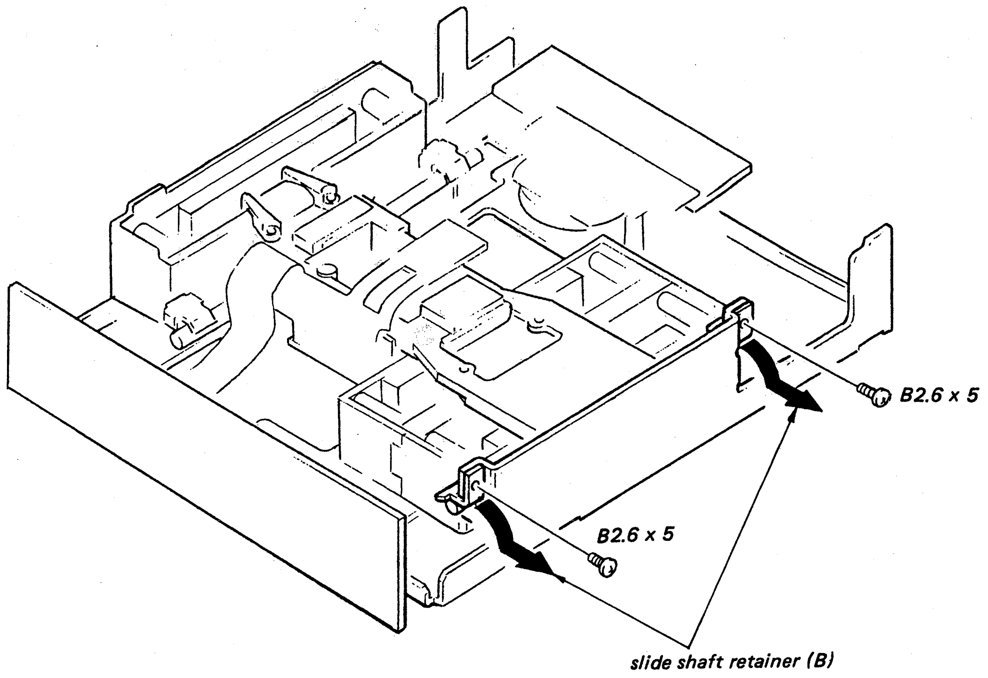
Refer to "NOTES ON HANDLING BU-1 (BASE UNIT)" on page 5 to prevent damage caused by static electricity.

SLED/SENSOR COIL (2)

❶ Perfrom flexible board removal ❶, ❷.

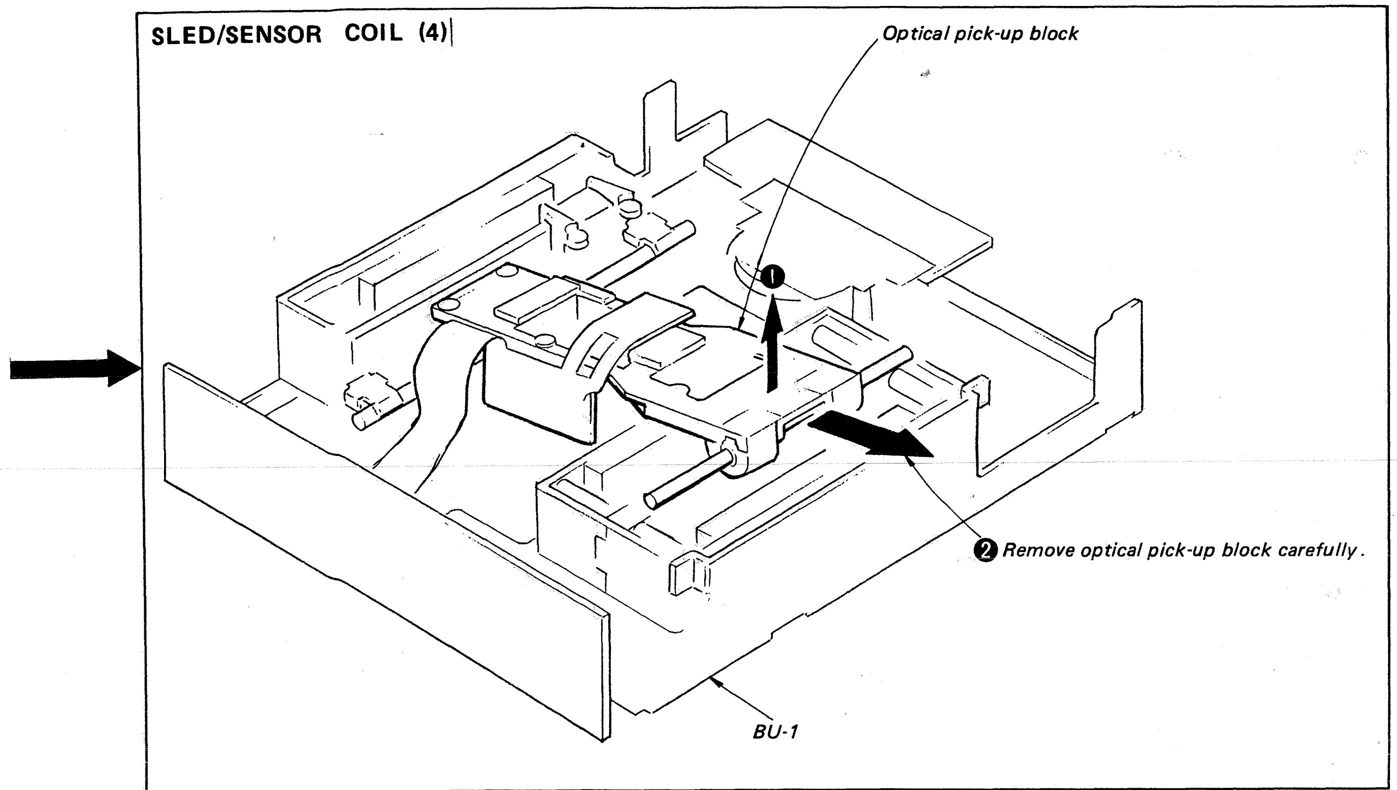


SLED/SENSOR COIL (3)


B2.6 x 5
B2.6 x 5
slide shaft retainer (B)

Refer to "NOTES ON HANDLING BU-1 (BASE UNIT)" on page 5 to prevent damage caused by static electricity.

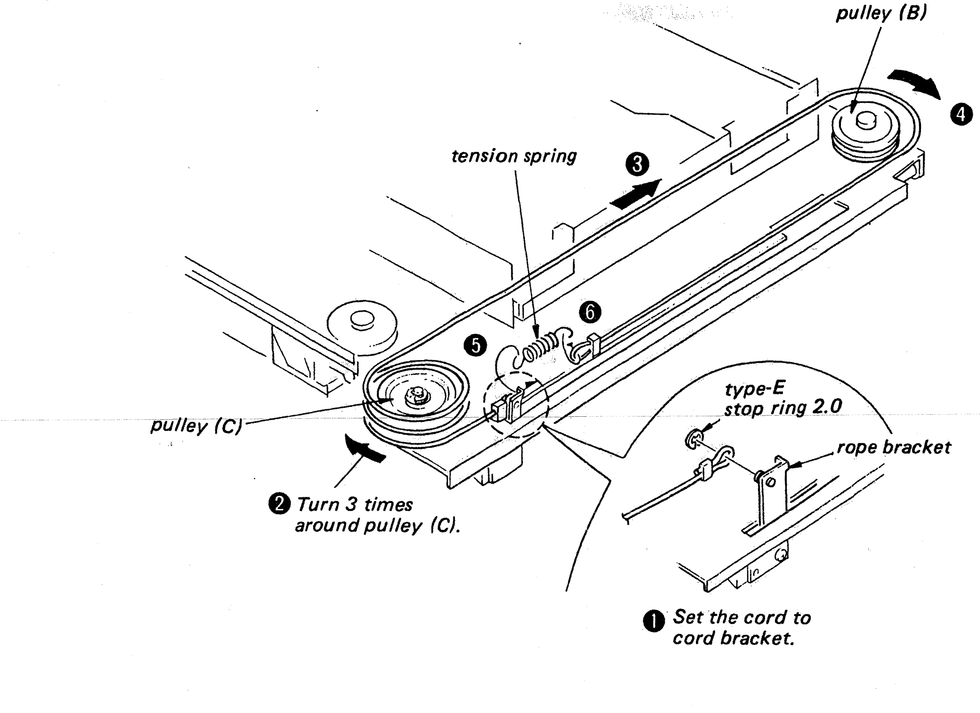
SLED/SENSOR COIL (4)


Optical pick-up block
❶
BU-1

❷ Remove optical pick-up block carefully.

Refer to "NOTES ON HANDLING BU-1 (BASE UNIT)" on page 5 to prevent damage caused by static electricity.

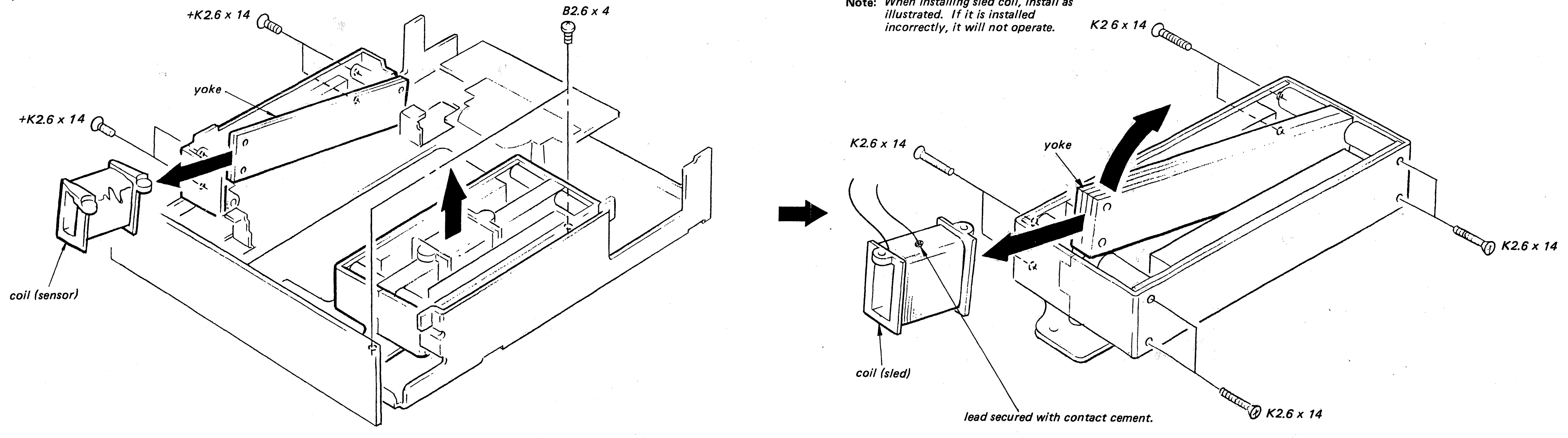
ROPE STRINGING


pulley (B)
❹
tension spring
❸
❺
❻
pulley (C)
type-E stop ring 2.0
rope bracket

❷ Turn 3 times around pulley (C).

❶ Set the cord to cord bracket.

SLED/SENSOR COIL (5)


+K2.6 x 14
B2.6 x 4
yoke
+K2.6 x 14
coil (sensor)
K2 6 x 14
K2.6 x 14
yoke
K2.6 x 14
coil (sled)
K2.6 x 14

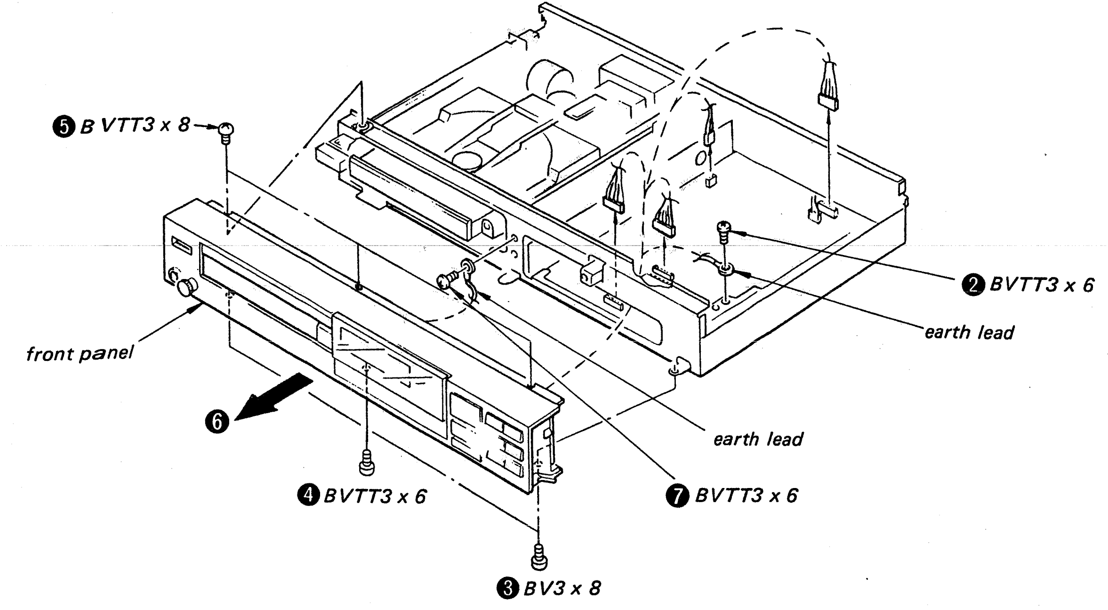
Note: *When installing sled coil, install as illustrated. If it is installed incorrectly, it will not operate.*

lead secured with contact cement.

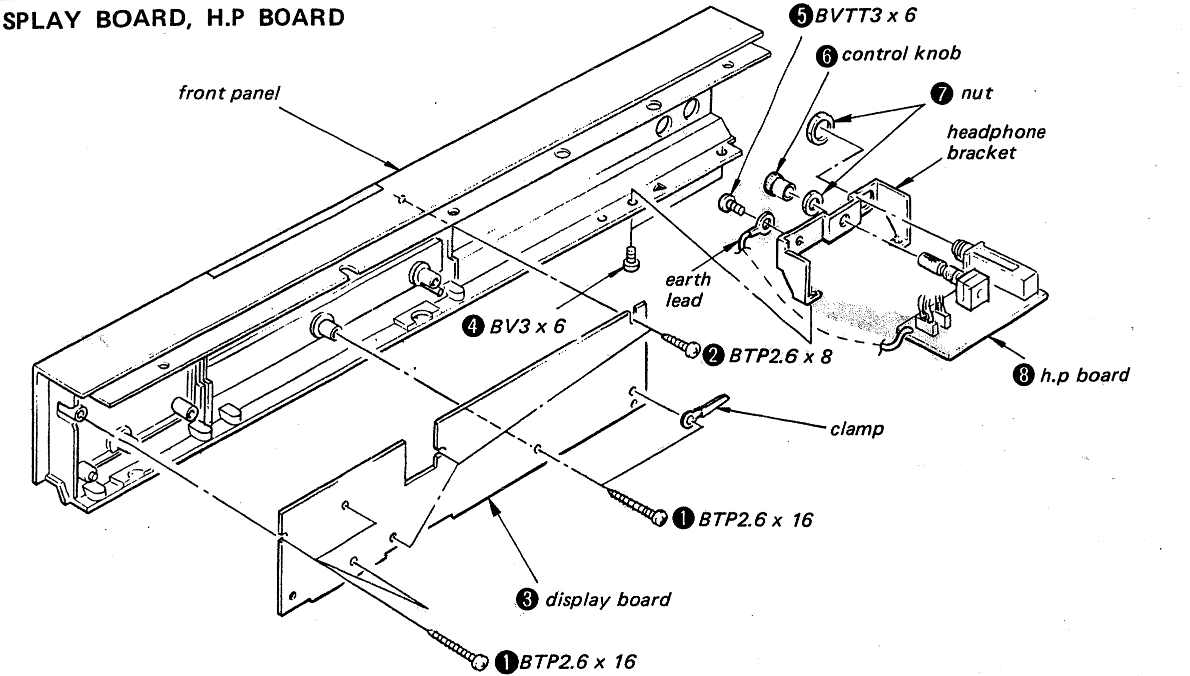
- Remove case by taking out seven screws:
  both sides, 4 pcs.
  rear side, 3 pcs.

FRONT PANEL

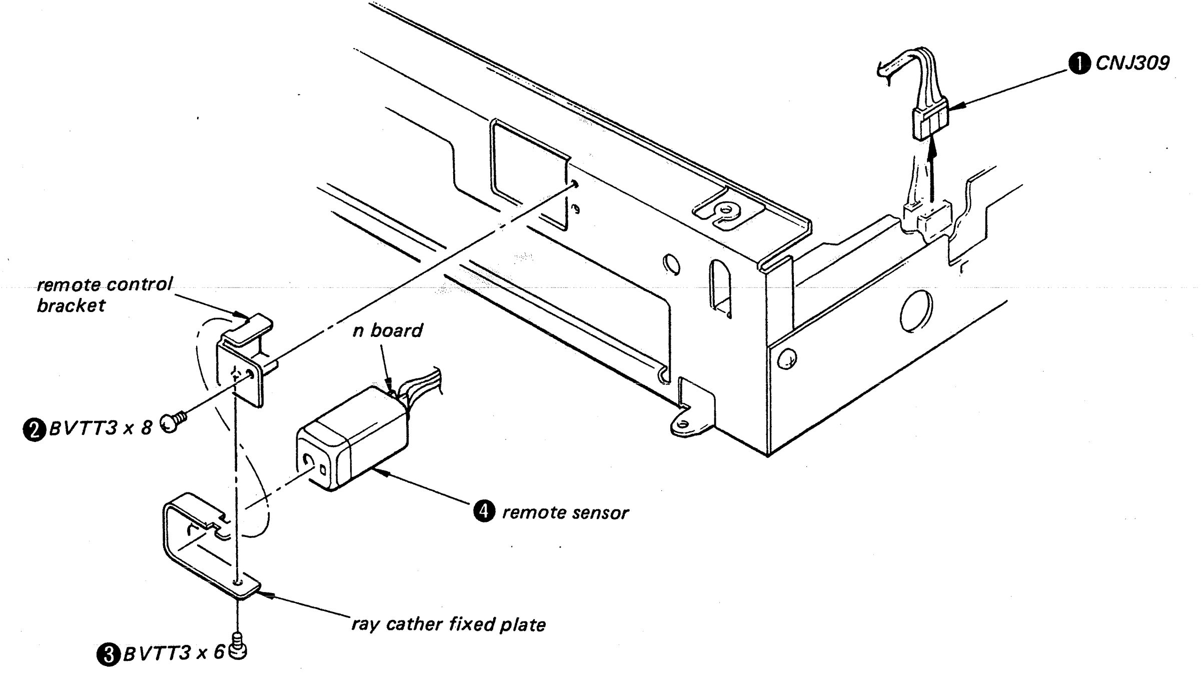
❶Remove each connector.


❺B VTT3 x 8
❷BVTT3 x 6
earth lead
front panel
❻
earth lead
❹BVTT3 x 6
❼BVTT3 x 6
❸BV3 x 8

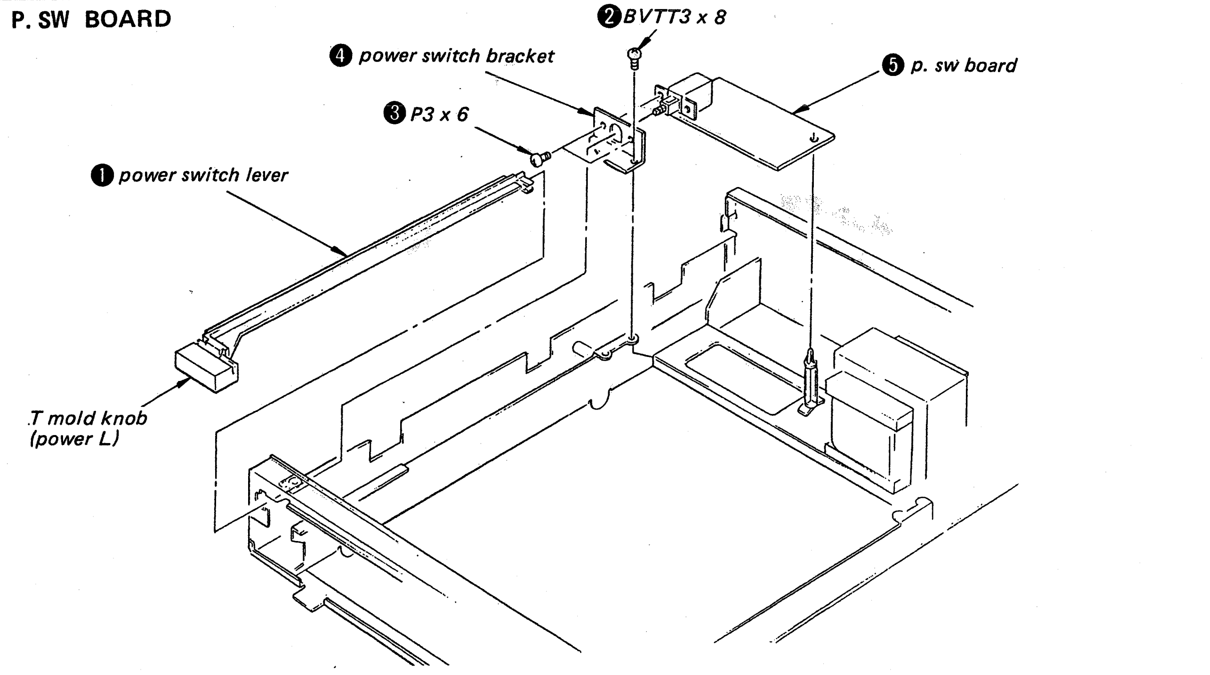
DISPLAY BOARD, H.P BOARD


❺BVTT3 x 6
❻control knob
front panel
❼nut
headphone bracket
earth lead
❹BV3 x 6
❷BTP2.6 x 8
❽h.p board
clamp
❶BTP2.6 x 16
❸display board
❶BTP2.6 x 16

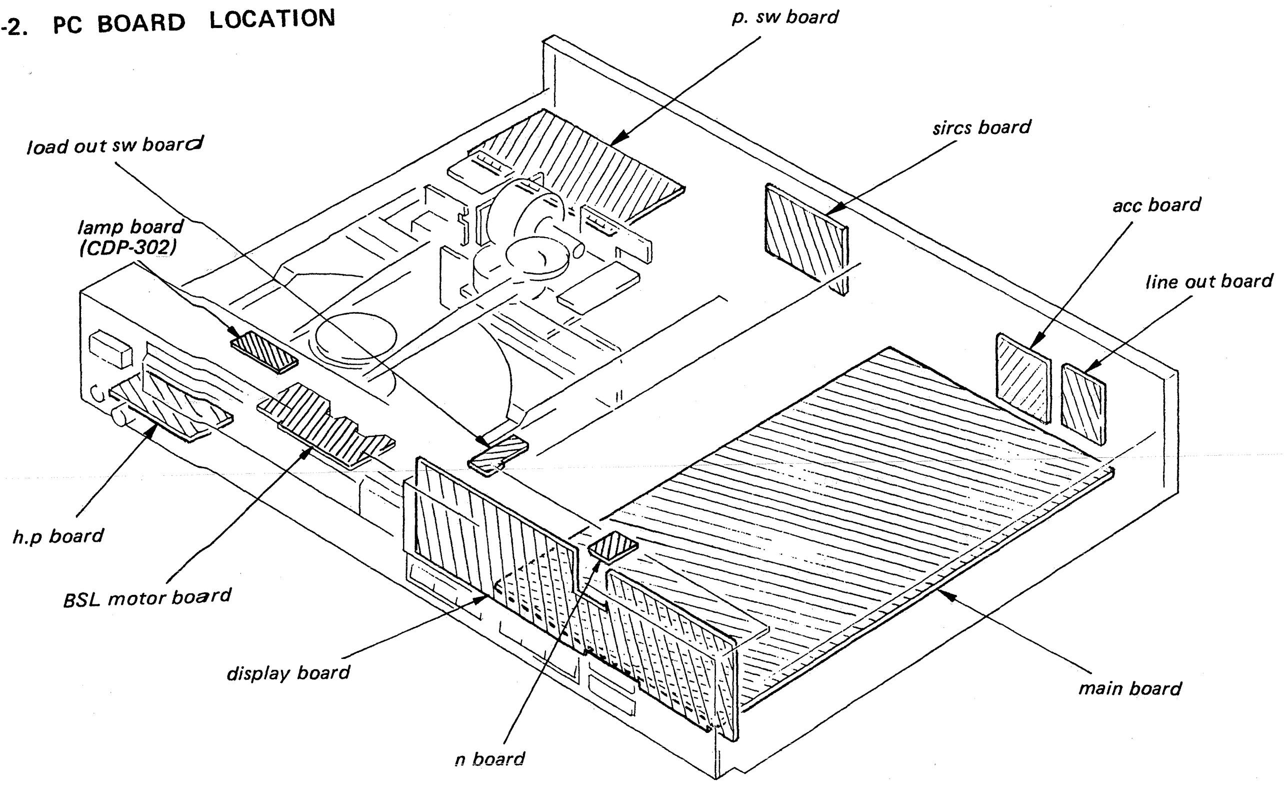
REMOTE SENSOR


❶CNJ309
remote control bracket
n board
❷BVTT3 x 8
❹remote sensor
ray cather fixed plate
❸BVTT3 x 6

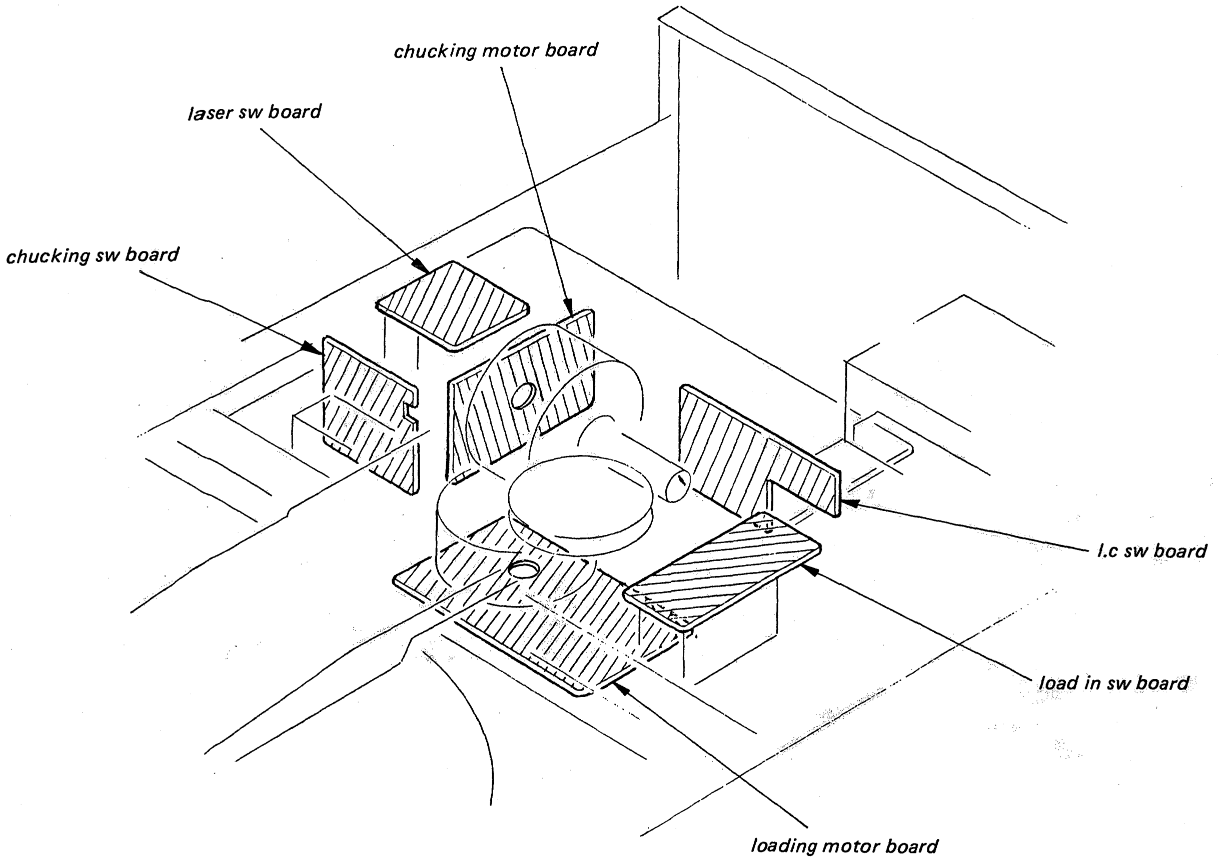
P. SW BOARD


❷BVTT3 x 8
❹power switch bracket
❺p. sw board
❸P3 x 6
❶power switch lever
T mold knob
(power L)

3-2. PC BOARD LOCATION


p. sw board
load out sw board
sircs board
lamp board
(CDP-302)
acc board
line out board
h.p board
BSL motor board
display board
main board
n board

MECHANICAL SECTION

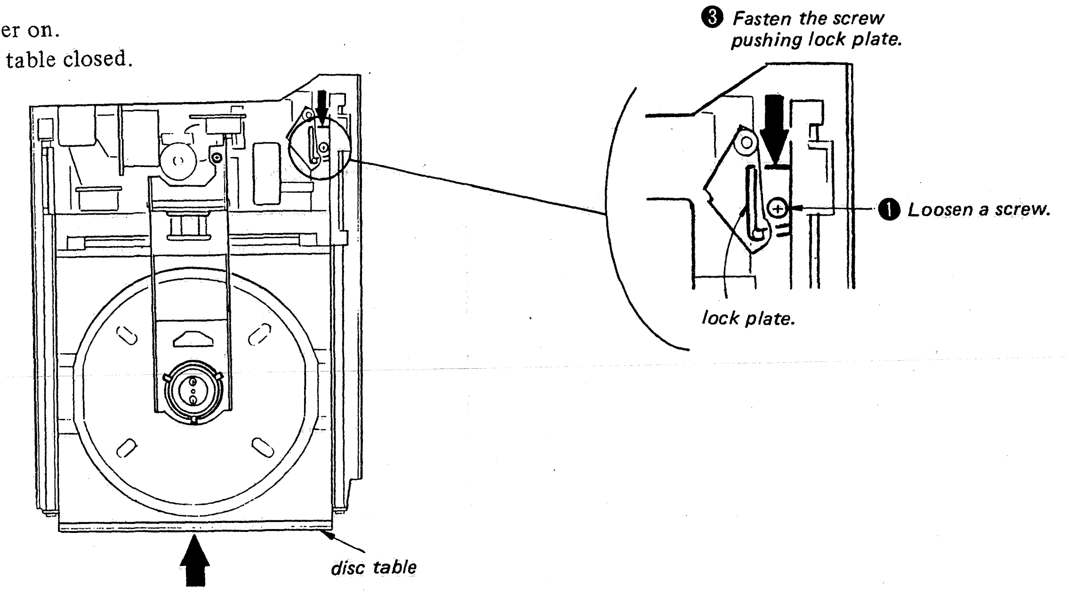

chucking motor board
laser sw board
chucking sw board
l.c sw board
load in sw board
loading motor board

SECTION 4
ADJUSTMENTS

4-1. MECHANICAL ADJUSTMENT

DISC TABLE POINT ADJUSTMENT

Setting:
- Turn power on.
- Keep disc table closed.


disc table
lock plate.

❸ Fasten the screw pushing lock plate.

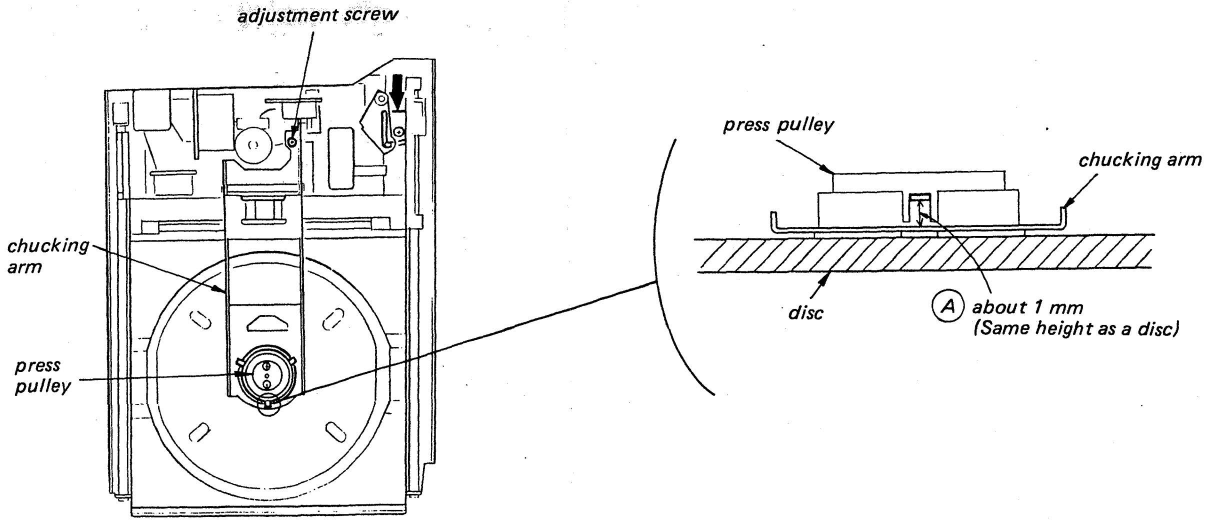
❶ Loosen a screw.

❷ Perform ❸ pressing lightly in the direction of the arrow.

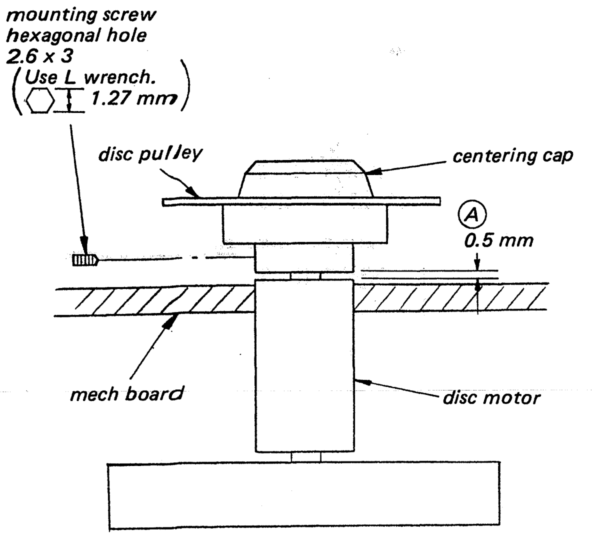
CHUCKING ARM HEIGHT ADJUSTMENT

Adjust the height of portion Ⓐ with disc inserted and disc table closed.

Repeat loading and confirm that chucking arm does not touch disc pulley.


adjustment screw
chucking arm
press pulley
press pulley
chucking arm
disc
Ⓐ about 1 mm
(Same height as a disc)

Disc Pully Height Adjustment


mounting screw
hexagonal hole
2.6 x 3
(Use L wrench. 1.27 mm)
disc pulley
centering cap
Ⓐ
0.5 mm
mech board
disc motor

Install the disc pulley so that clearance Ⓐ is 0.5 mm.

Confirm that centering cap moves up and down.

4-2. ELECTRICAL ADJUSTMENTS

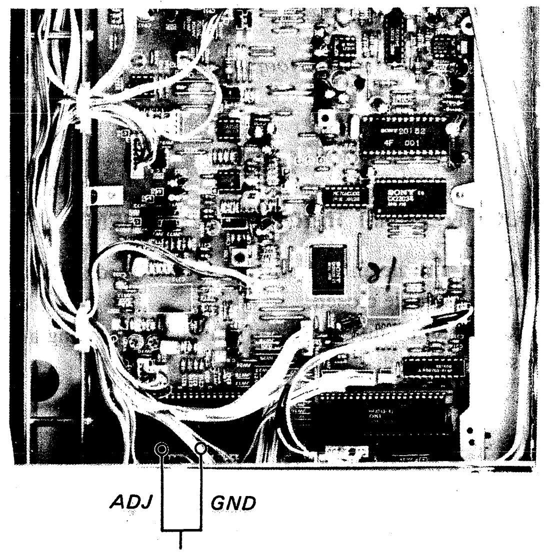
1. Perform adjustments in the order given.
2. Use YEDS-1 disc unless otherwise indicated.
3. Use the oscilloscope with more than 10MΩ impedance.

Adjustment Mode

1. Connect main amp board test point ADJ and GND.
   (This is to prevent the disc table from opening even though pits are not read, by making microcomputer IC303 pin ④ low.)
2. Turn POWER switch on.
   (To reset microcomputer.)

After adjustment, remove the lead wire connecting test points ADJ and GND.

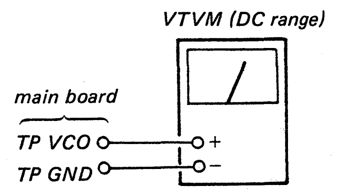
Adjustment Location: main board.

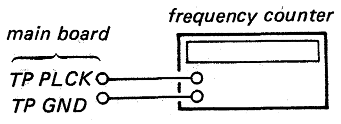


Connect test points ADJ and GND.

RF PLL Adjustment

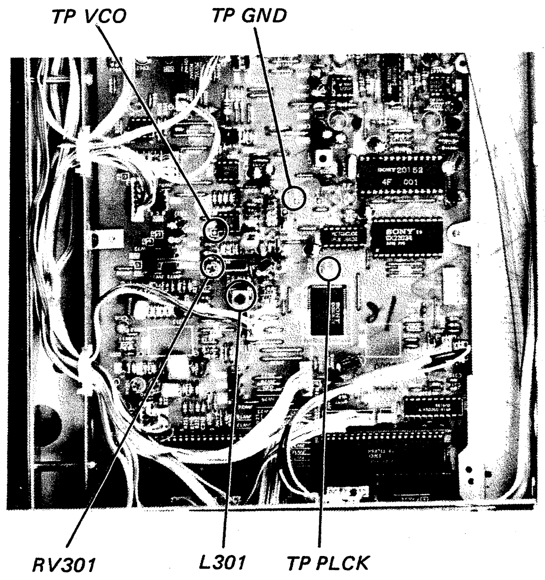
Procedure:


VTVM (DC range)
main board
TP VCO
TP GND
+
−


frequency counter
main board
TP PLCK
TP GND

1. Turn POWER switch ON. (stop mode).
2. Keep disc table opened.
3. Put set into adjustment mode (See page 37.)
4. Connect VTVM to main board test points TP VCO and TP GND.
5. Adjust main board RV301 so that reading on VTVM is OV ± 50 mV.
6. Connect the frequency counter to main board test points TP PLCK and TP GND.
7. Adjust main board L301 so that reading on frequency counter is 4.2818 MHz ± 10 KHz.
8. Reconnect lead wires connected in adjustment mode.
9. Put disc (YEDS-1) in and press ▷ PLAY button.
10. Confirm that reading on frequency counter is 4.3218 MHz.

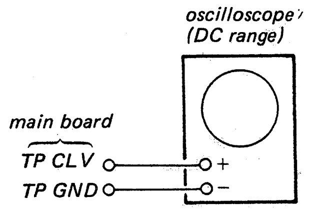
Adjustment Location: main board.


TP VCO
TP GND
RV301
L301
TP PLCK

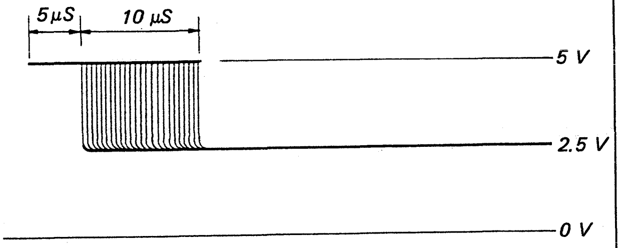
CLV Phase Lock Check

Perform this check when replacing BU-1 (base unit) and press pully in chucking arm section.)

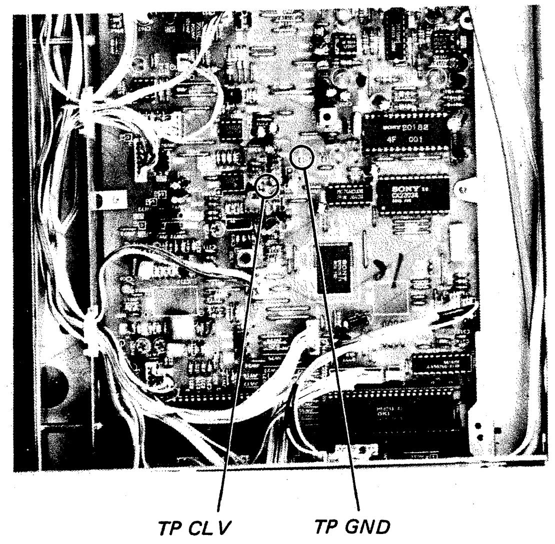
Procedure:


oscilloscope
(DC range)
main board
TP CLV
TP GND
+
−

1. Put disc (YEDS-1) in.
2. Connect oscilloscope to main board test points TP CLV and TP GND.
3. Press ▷ PLAY button in TRACK 1 mode.
4. Confirm that the waveform is as shown in the figure below.



Adjustment Location: main board.


TP CLV
TP GND

REFERENCE

Focus/Tracking Gain Adjustment

A frequency responce analyzer is necessary in order to perform this adjustment exactly.

However, this gain has a margin, so even if it is slightly off, there is no problem. Therefore, do not perform this adjustment.

Focus/tracking gain determines the pick-up follow-up (vertical and horizontal) relative to mechanical noise and mechanical shock when the 2-axis device operate.

However, as these reciprocate, the adjustment is at the point where both are satisfied.

- When gain is raised, the noise when the 2-axis device operates increases.
- When gain is lowered, it is more susceptible to mechanical shock and skipping occurs more easily.
- When gain adjustment is off, the symptoms below appear.

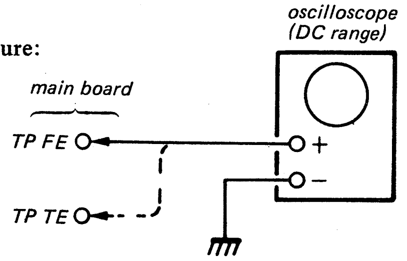
Gain / Symptoms	Focus	Tracking
• The time until music starts becomes longer for STOP →▷PLAY or automatic selection (⏮, ⏭buttons pressed. (Normally takes about 2 seconds.)	low	low or high
• Music does not start and disc continues to rotate for STOP→▷PLAY or automatic selection (⏮, ⏭ buttons pressed.)	–	low
• Disc table opens shortly after STOP→▷PLAY.	low or high	–
• Sound is interrupted during PLAY. Or time counter display stops progressing.	–	low
• More poise during 2-axis device operation.	high	high

The following is a simple adjustment method.

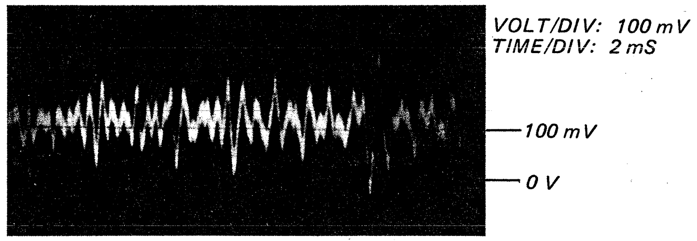
– Simple Adjustment –

Note: Since exact adjustment cannot be performed, remember the positions of the controls before performing the adjustment. If the positions after the simple adjustment are only a little different, return the controls to the original position.

Procedure:

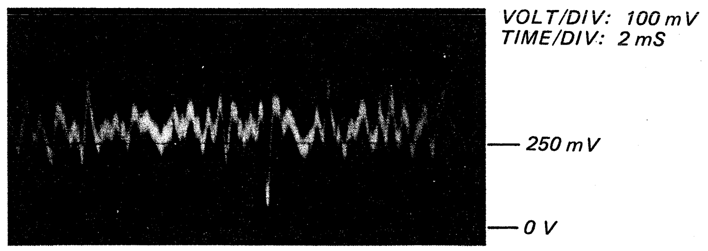

oscilloscope
(DC range)
main board
TP FE
TP TE
+
–

1. Keep the set horizontal.
   (If the set is not horizontal, this adjustment cannot be performed due to the gravity against the 2 axis device.)
2. Put set in adjustment mode. (see page 37)
3. Insert disc (YEDS-1) and press ▷PLAY button.
4. Connect oscilloscope to main amp board TP FE.
5. Adjustment RV201 so that the waveform is as shown in the figure below. (focus gain adjustment)

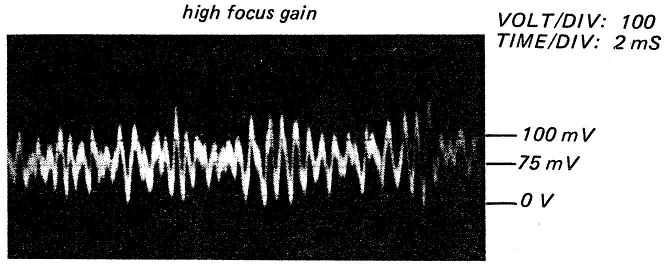


- Incorrent Examples (DC level changes more than on adjusted waveform)

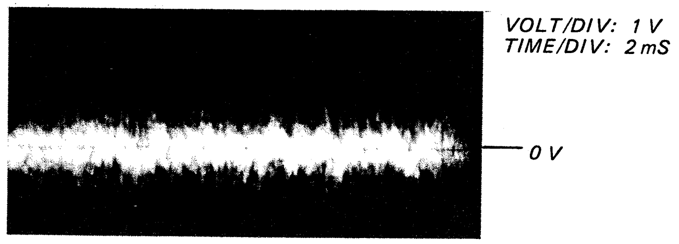
low focus gain



high focus gain

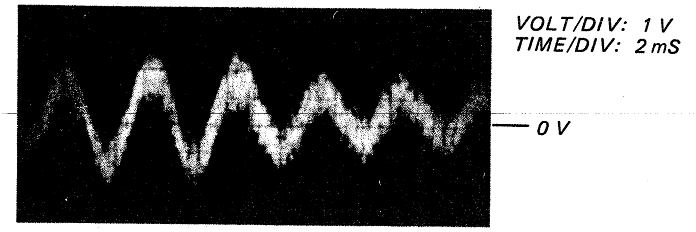


6. Connect oscilloscope to main board TP TE.
7. Adjust RV202 so that the waveform is as shown in the figure below. (tracking gain adjustment)

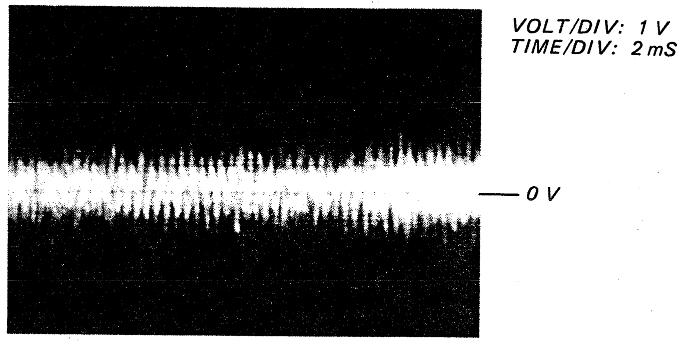


- Incorrect Examples (fundamental wave appears)

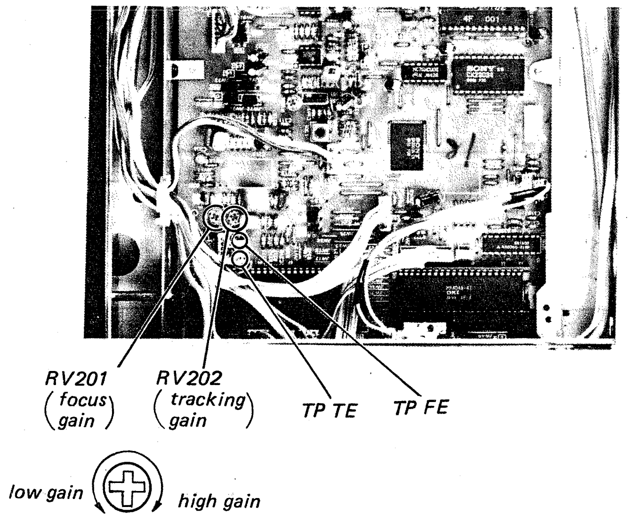
low tracking gain



high tracking gain
(higher fundamental wave than for low gain)

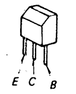


Adjustment Location: main board

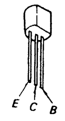

RV201
(focus gain)
RV202
(tracking gain)
TP TE
TP FE
low gain
high gain

- **Semiconductor Lead Layouts**

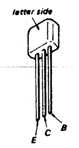
2SD774-5
2SB734-2



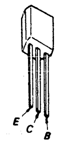
2SB740
2SC2001



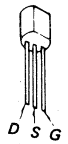
2SA1175
2SC2785-E


letter side
E C B

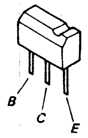
DTA114ES
DTC114ES
DTC144ES
DTC143TS



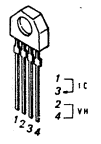
2SK152



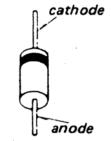
2SA874
DTC143TF



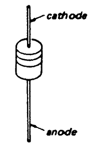
THS103A-1


1 3 IC
2 4 VH
1 2 3 4

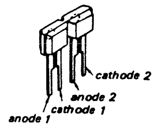
10DF2
10E-2
HZ5CLL
RD2.7E-L1
RD5.1E-B1
RD8.2E-B2
RD33E-B3


cathode
anode

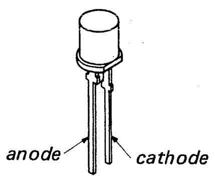
1SS119


cathode
anode

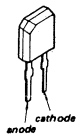
KV1236Z


cathode 2
anode 2
cathode 1
anode 1

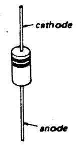
GL-5NG27


anode
cathode

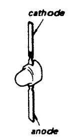
PH302B


cathode
anode

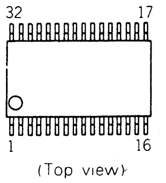
21DQ05


cathode
anode

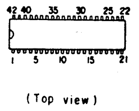
AA5535S
BG5535S


cathode
anode

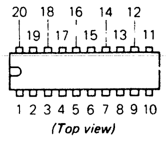
CX20108


32 17
1 16
(Top view)

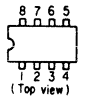
MSM6404A-39RS
MSM6404A-41RS


42 40 35 30 25 22
1 5 10 15 21
(Top view)

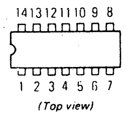
M50760-414P


20 18 16 14 12
19 17 15 13 11
1 2 3 4 5 6 7 8 9 10
(Top view)

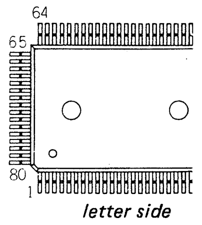
CX20197
NJM4558D-FA
TDB0353DP
μPC4082C
μPC4558C


8 7 6 5
1 2 3 4
(Top view)

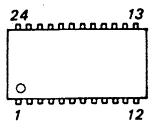
MB84066B
TC74HCU04P


14 13 12 11 10 9 8
1 2 3 4 5 6 7
(Top view)

CX23035


64
65
80
1
letter side

MB8416-20LPF



n in

OLT/DIV: 1 V
ME/DIV: 2 mS

0 V

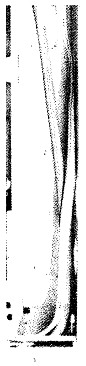
)

OLT/DIV: 1 V
ME/DIV: 2 mS

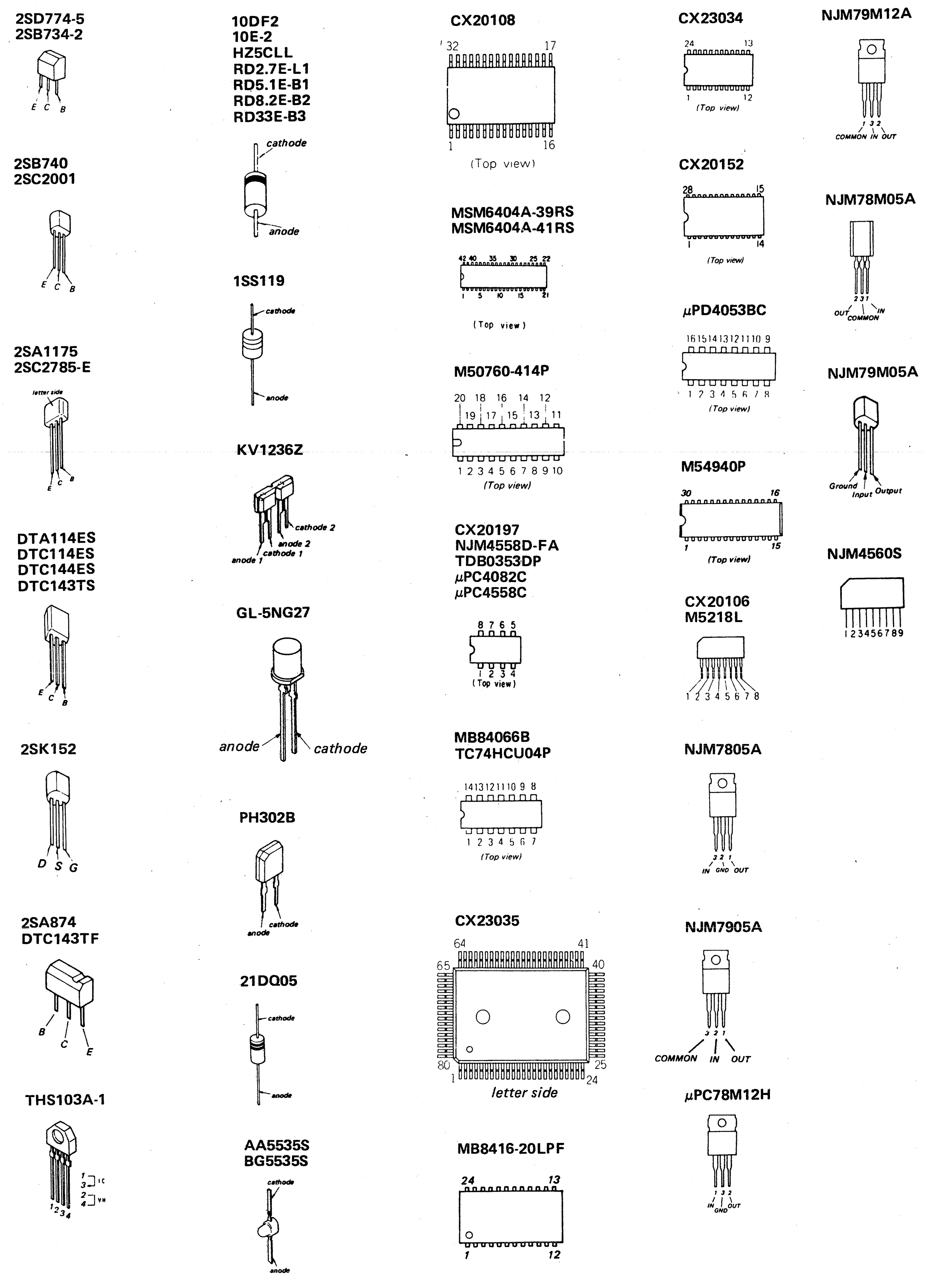
0 V

OLT/DIV: 1 V
IME/DIV: 2 mS

0 V

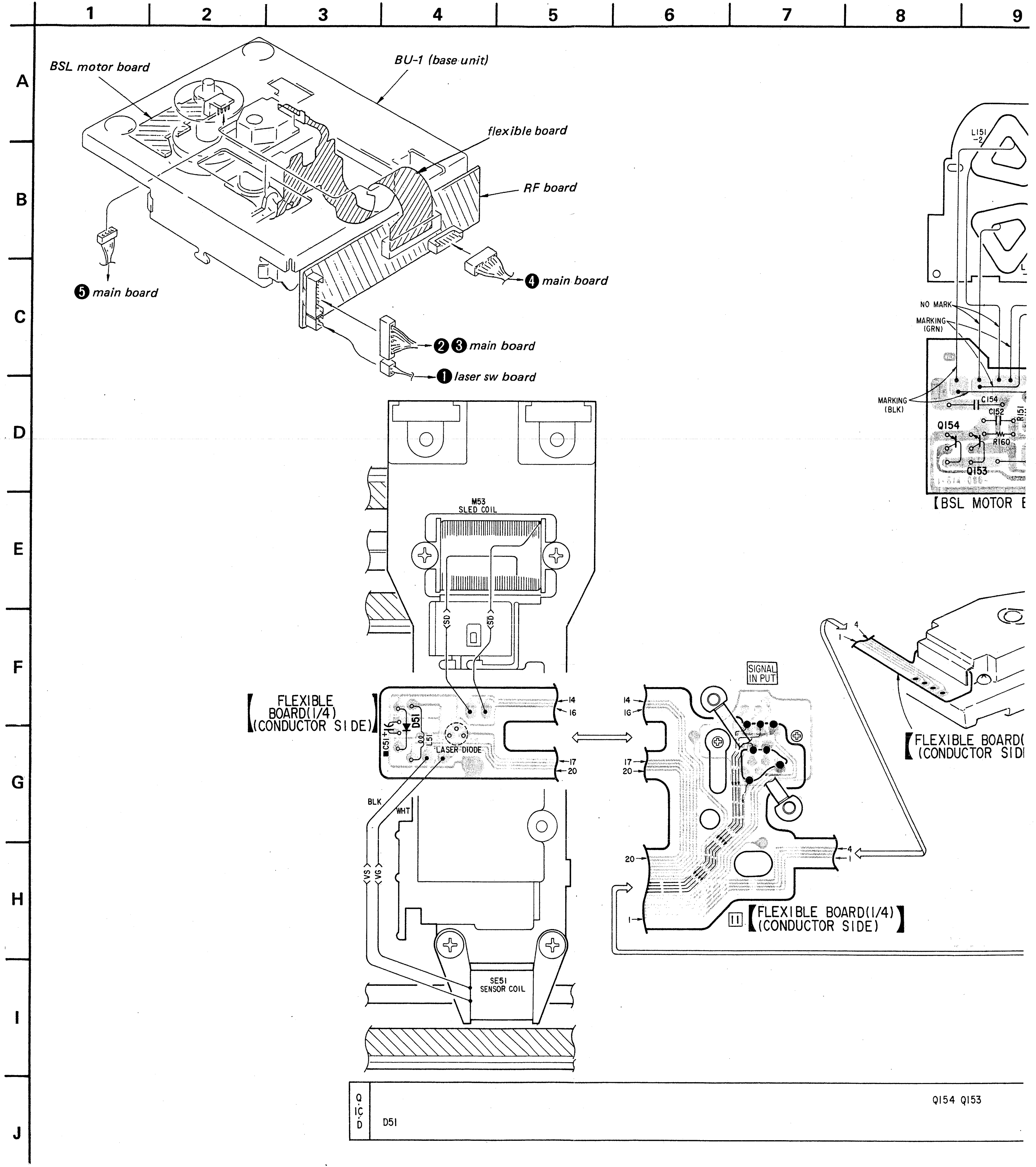


- **Semiconductor Lead Layouts**


2SD774-5
2SB734-2
E C B
2SB740
2SC2001
E C B
2SA1175
2SC2785-E
letter side
E C B
DTA114ES
DTC114ES
DTC144ES
DTC143TS
E C B
2SK152
D S G
2SA874
DTC143TF
B C E
THS103A-1
1 3 IC
2 4 VH
1 2 3 4
10DF2
10E-2
HZ5CLL
RD2.7E-L1
RD5.1E-B1
RD8.2E-B2
RD33E-B3
cathode
anode
1SS119
cathode
anode
KV1236Z
cathode 2
anode 2
cathode 1
anode 1
GL-5NG27
anode
cathode
PH302B
cathode
anode
21DQ05
cathode
anode
AA5535S
BG5535S
cathode
anode
CX20108
32 17
1 16
(Top view)
MSM6404A-39RS
MSM6404A-41RS
42 40 35 30 25 22
1 5 10 15 21
(Top view)
M50760-414P
20 19 18 17 16 15 14 13 12 11
1 2 3 4 5 6 7 8 9 10
(Top view)
CX20197
NJM4558D-FA
TDB0353DP
µPC4082C
µPC4558C
8 7 6 5
1 2 3 4
(Top view)
MB84066B
TC74HCU04P
14 13 12 11 10 9 8
1 2 3 4 5 6 7
(Top view)
CX23035
64 41
65 40
80 25
1 24
letter side
MB8416-20LPF
24 13
1 12
CX23034
24 13
1 12
(Top view)
CX20152
28 15
1 14
(Top view)
µPD4053BC
16 15 14 13 12 11 10 9
1 2 3 4 5 6 7 8
(Top view)
M54940P
30 16
1 15
(Top view)
CX20106
M5218L
1 2 3 4 5 6 7 8
NJM7805A
3 2 1
IN GND OUT
NJM7905A
3 2 1
COMMON IN OUT
µPC78M12H
1 3 2
IN GND OUT
NJM79M12A
1 3 2
COMMON IN OUT
NJM78M05A
2 3 1
OUT COMMON IN
NJM79M05A
Ground Input Output
NJM4560S
1 2 3 4 5 6 7 8 9

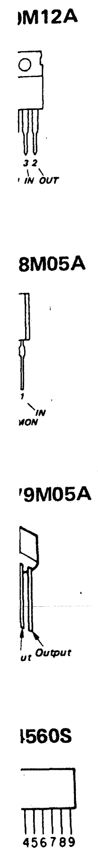
SECTION 5
DIAGRAMS

5-1. MOUNTING DIAGRAM
— BU-1 (BASE UNIT) Section —


1
2
3
4
5
6
7
8
9
A
B
C
D
E
F
G
H
I
J
BSL motor board
BU-1 (base unit)
flexible board
RF board
⑤ main board
④ main board
②③ main board
① laser sw board
M53
SLED COIL
SD
SD
FLEXIBLE BOARD(1/4) (CONDUCTOR SIDE)
C51
D51
L51
LASER DIODE
14
16
17
20
SIGNAL IN PUT
14
16
17
20
4
1
20
BLK
WHT
VS
VG
SE51
SENSOR COIL
FLEXIBLE BOARD(1/4) (CONDUCTOR SIDE)
FLEXIBLE BOARD((CONDUCTOR SID
4
1
L151
NO MARK
MARKING (GRN)
MARKING (BLK)
C154
C152
R151
Q154
R160
Q153
BSL MOTOR B
Q
IC
D
D51
Q154 Q153

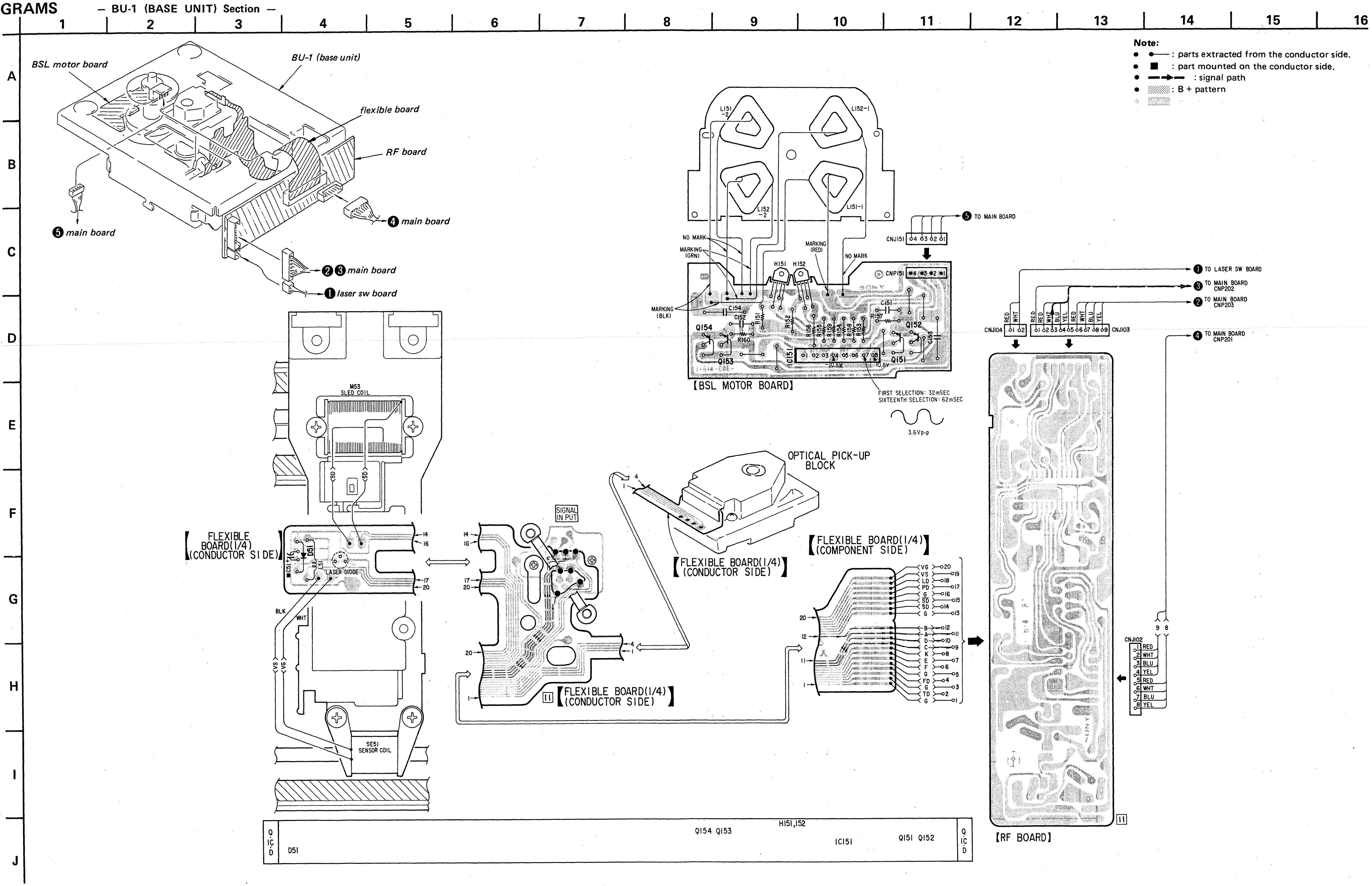
SECTION 5
DIAGRAMS

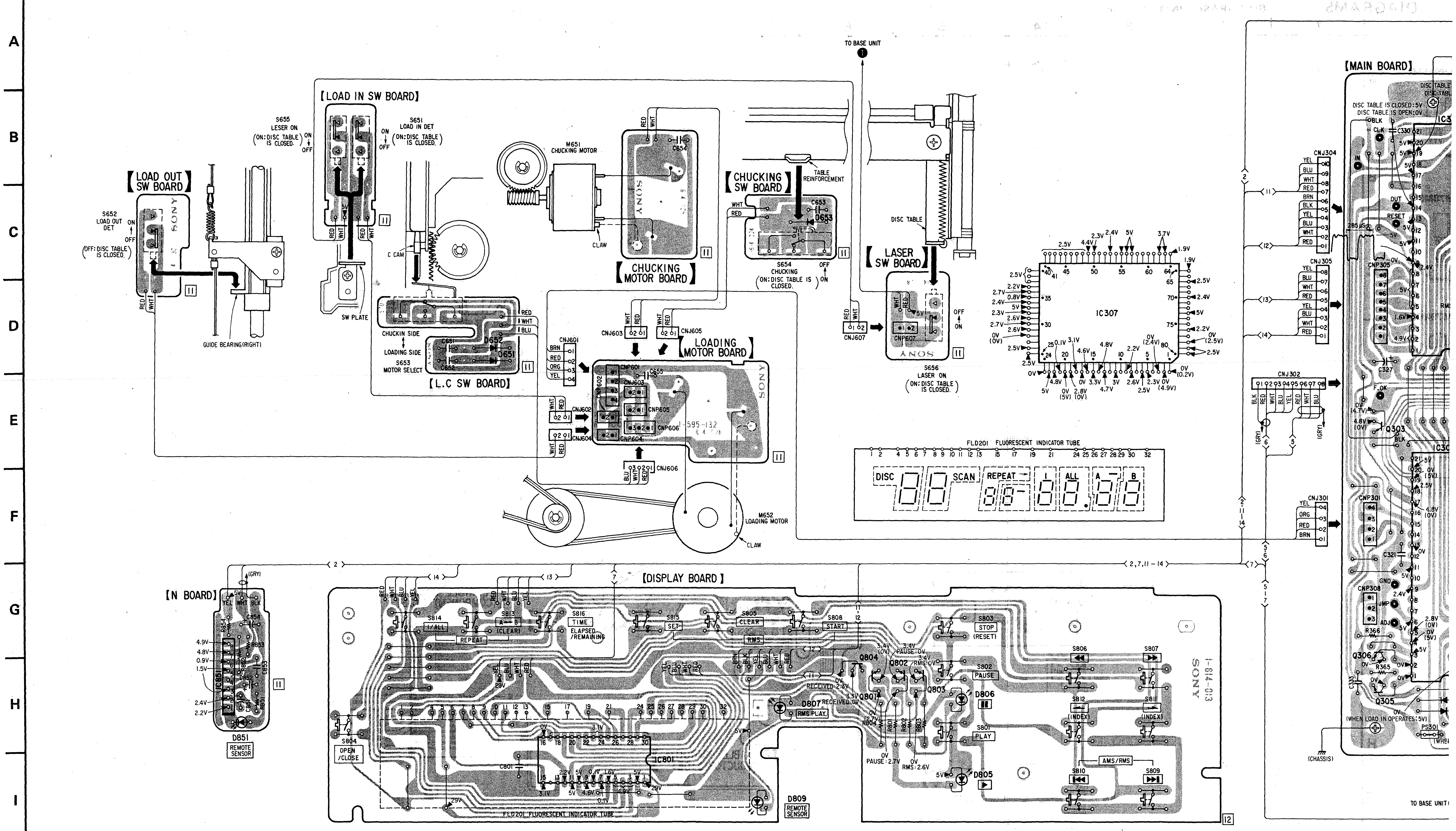
5-1. MOUNTING DIAGRAM
– BU-1 (BASE UNIT) Section –


M12A
8M05A
9M05A
560S
456789

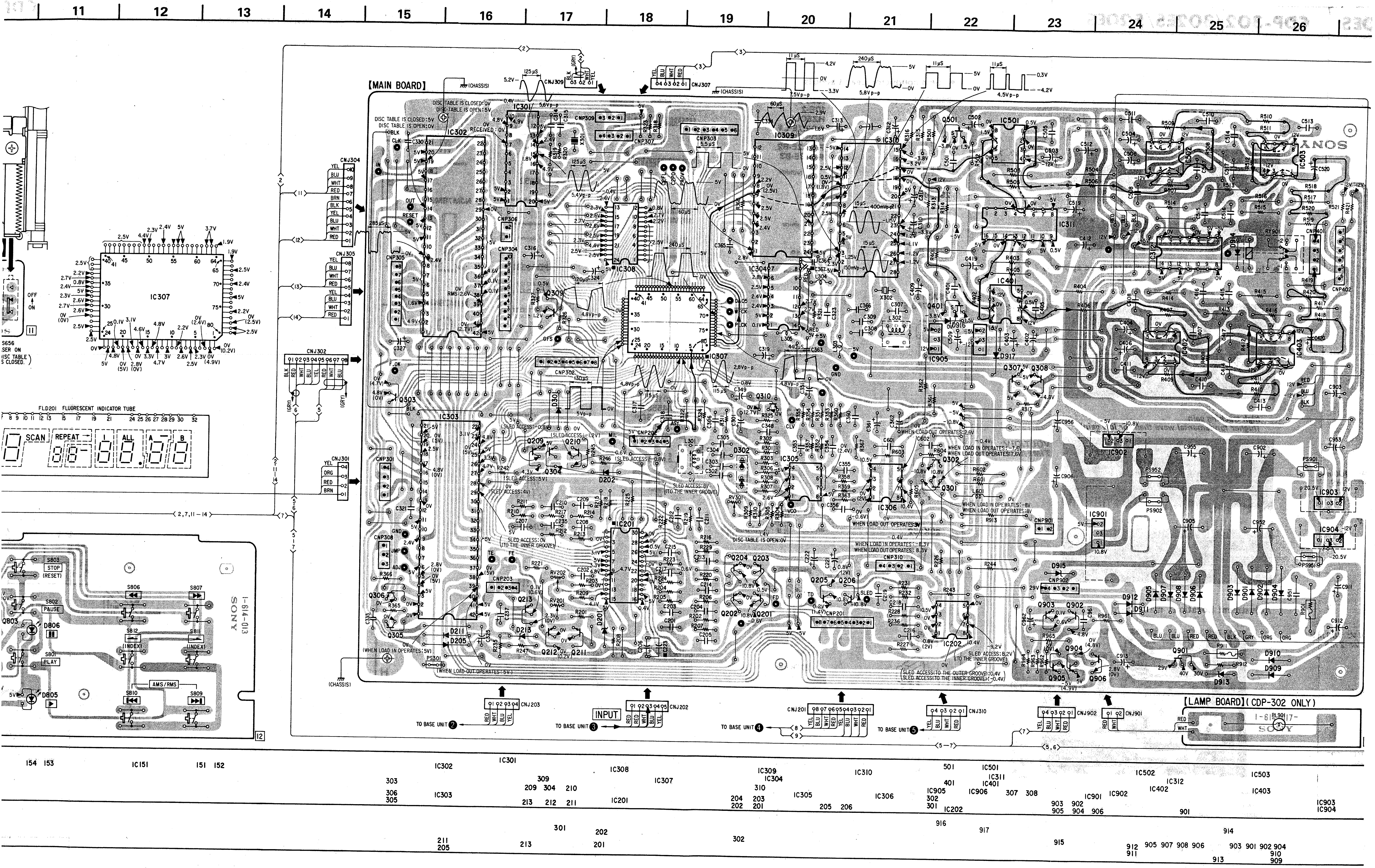
Note:

- ●—: parts extracted from the conductor side.
- ■ : part mounted on the conductor side.
- ━━➜━ : signal path
- ▨ : B + pattern

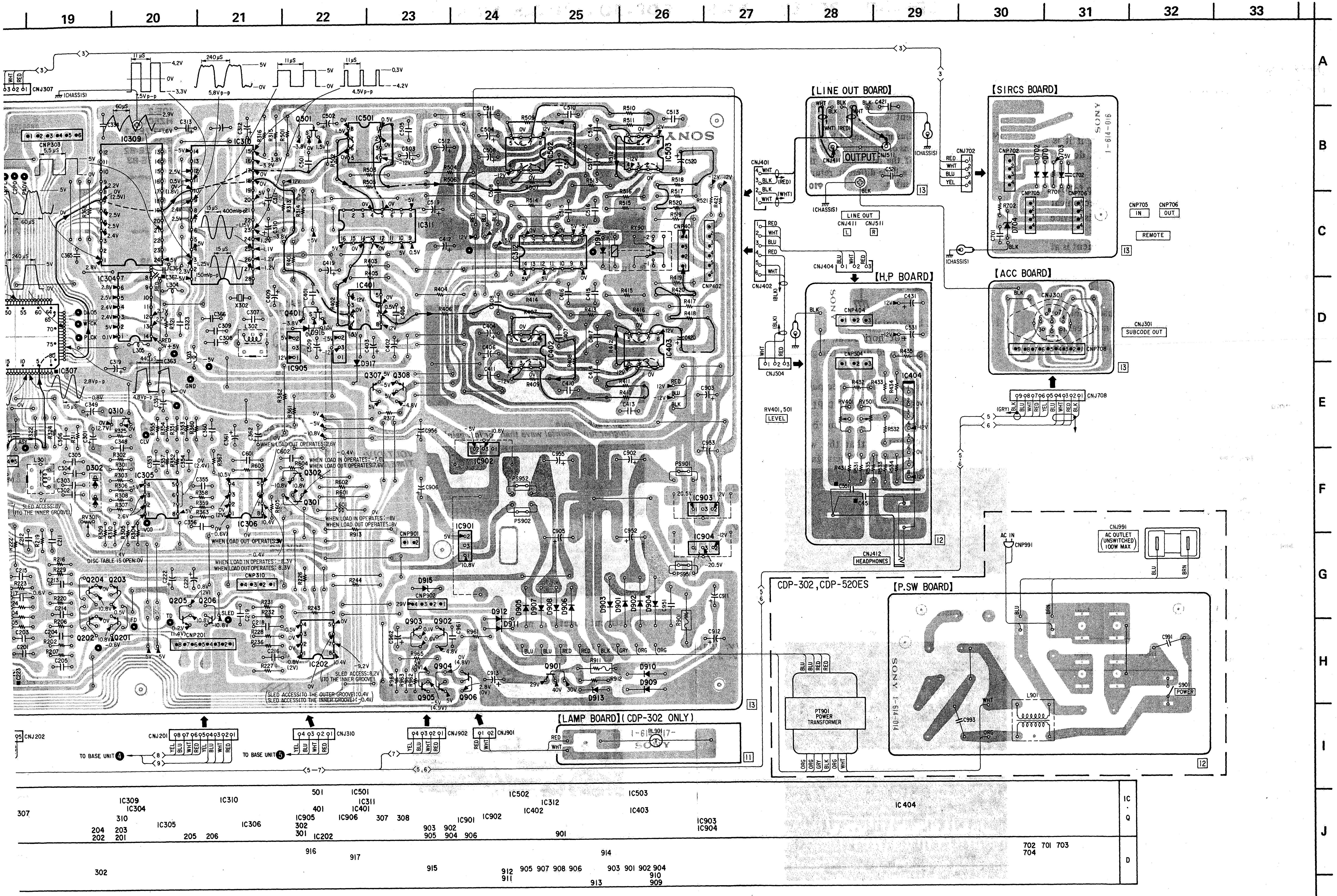

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
A
B
C
D
E
F
G
H
I
J
BSL motor board
BU-1 (base unit)
flexible board
RF board
❹ main board
❺ main board
❷❸ main board
❶ laser sw board
L151-2
L152-1
L152-2
L151-1
❺ TO MAIN BOARD
CNJ151
NO MARK
MARKING (GRN)
MARKING (RED)
NO MARK
MARKING (BLK)
H151
H152
CNP151
C154
C152
C151
R151
R152
R156
R155
R159
R158
R154
R153
R157
R160
Q154
Q153
Q152
Q151
IC151
C153
10.8V
10.8V
【BSL MOTOR BOARD】
FIRST SELECTION: 32mSEC
SIXTEENTH SELECTION: 62mSEC
3.6Vp-p
❶ TO LASER SW BOARD
❸ TO MAIN BOARD CNP202
❷ TO MAIN BOARD CNP203
❹ TO MAIN BOARD CNP201
CNJ104
CNJ103
RED
WHT
BLU
YEL
M53 SLED COIL
SD
SD
【FLEXIBLE BOARD(1/4) (CONDUCTOR SIDE)】
C51
D51
LASER DIODE
14
16
17
20
SIGNAL IN PUT
OPTICAL PICK-UP BLOCK
【FLEXIBLE BOARD(1/4) (CONDUCTOR SIDE)】
【FLEXIBLE BOARD(1/4) (COMPONENT SIDE)】
VG 20
VS 19
LD 18
PD 17
G 16
SD 15
SD 14
G 13
B 12
A 11
D 10
C 9
K 8
E 7
F 6
G 5
FD 4
G 3
TD 2
G 1
【FLEXIBLE BOARD(1/4) (CONDUCTOR SIDE)】
BLK
WHT
VS
VG
SE51 SENSOR COIL
CNJ102
1 RED
2 WHT
3 BLU
4 YEL
5 RED
6 WHT
7 BLU
8 YEL
9
8
【RF BOARD】
Q IC D
D51
Q154 Q153
H151,152
IC151
Q151 Q152
Q IC D

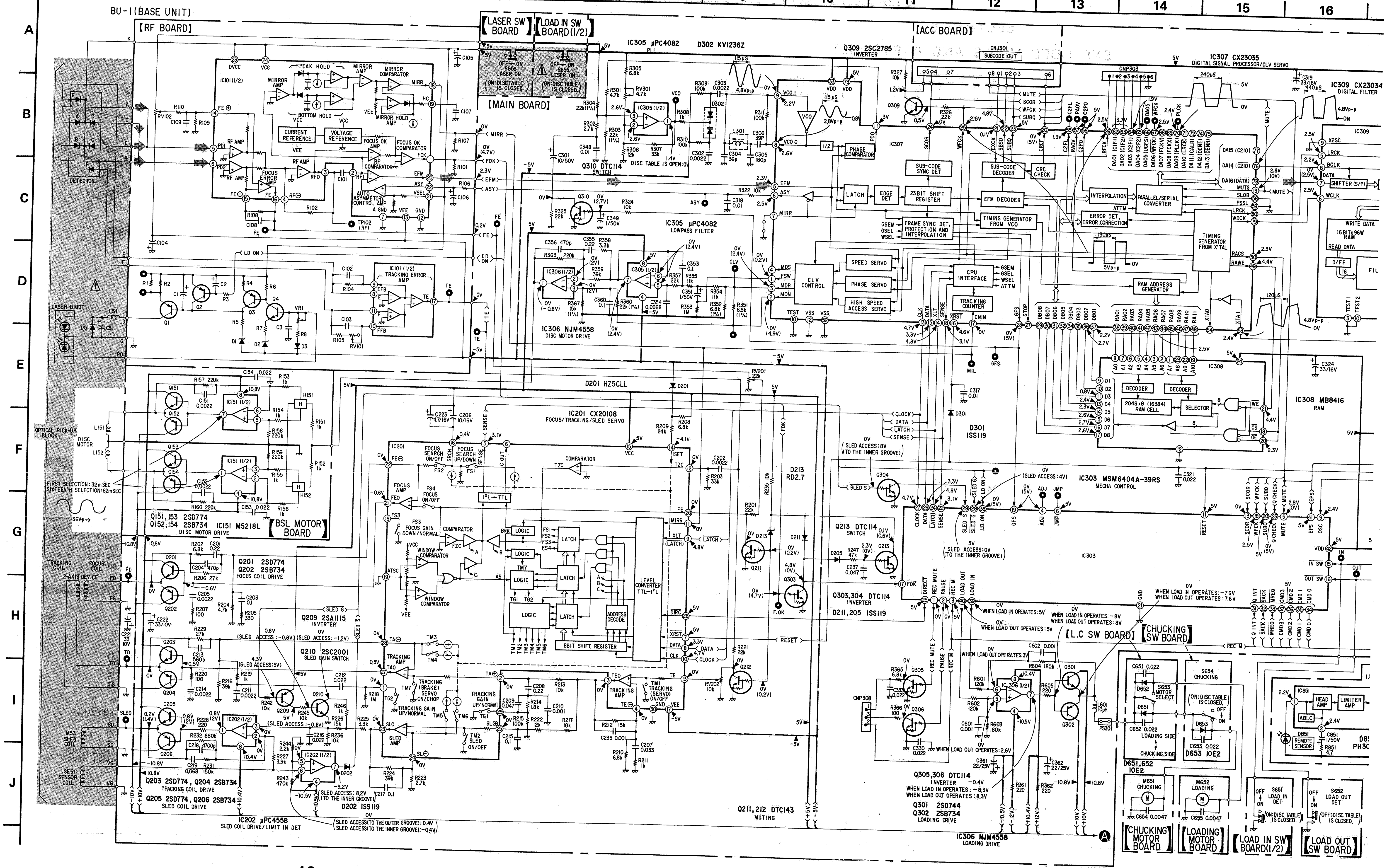

A
B
C
D
E
F
G
H
I
TO BASE UNIT
【MAIN BOARD】
【LOAD IN SW BOARD】
S655 LESER ON (ON: DISC TABLE IS CLOSED.)
S651 LOAD IN DET (ON: DISC TABLE IS CLOSED.)
M651 CHUCKING MOTOR
【LOAD OUT SW BOARD】
S652 LOAD OUT DET (OFF: DISC TABLE IS CLOSED.)
【CHUCKING SW BOARD】
TABLE REINFORCEMENT
DISC TABLE
S654 CHUCKING (ON: DISC TABLE IS CLOSED.)
【LASER SW BOARD】
S656 LASER ON (ON: DISC TABLE IS CLOSED.)
【CHUCKING MOTOR BOARD】
CLAW
C CAM
SW PLATE
GUIDE BEARING(RIGHT)
CHUCKIN SIDE
LOADING SIDE
S653 MOTOR SELECT
【L.C SW BOARD】
【LOADING MOTOR BOARD】
CNJ601
CNJ602
CNJ603
CNJ604
CNJ605
CNJ606
CNJ607
IC307
CNJ304
CNJ305
CNJ302
CNJ301
FLD201 FLUORESCENT INDICATOR TUBE
DISC
SCAN
REPEAT
ALL
M652 LOADING MOTOR
【N BOARD】
IC851
D851 REMOTE SENSOR
【DISPLAY BOARD】
S814 1/ALL
REPEAT
S813 A↔B (CLEAR)
S816 TIME ELAPSED/REMAINING
S815 SET
S805 CLEAR
RMS
S808 START
S803 STOP (RESET)
S806
S807
S802 PAUSE
S812 (INDEX)
S811 (INDEX)
S801 PLAY
AMS/RMS
S810
S809
Q804
Q802
Q801
Q803
D806
D807 RMS PLAY
D805
S804 OPEN/CLOSE
C801
IC801
D809 REMOTE SENSOR
FLD201 FLUORESCENT INDICATOR TUBE
Q303
Q306
Q305
PS301
(CHASSIS)
(WHEN LOAD IN OPERATES: 5V)
1-595-132
1-614-013
SONY

IC·Q	IC851	IC801	154 153 804 801 802 803	IC151	151 152	303 306 305	IC30 IC30
D	851	652 651					211 205



11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26
[MAIN BOARD]
[LAMP BOARD] (CDP-302 ONLY)
FLD201 FLUORESCENT INDICATOR TUBE
SCAN
REPEAT
ALL
IC307
IC301
IC302
IC303
IC304
IC305
IC306
IC308
IC309
IC310
IC311
IC312
IC201
IC202
IC401
IC402
IC403
IC501
IC502
IC503
IC901
IC902
IC903
IC904
IC905
CNJ301
CNJ302
CNJ304
CNJ305
CNJ307
CNJ309
CNJ201
CNJ202
CNJ203
CNJ310
CNJ901
CNJ902
DISC TABLE IS CLOSED: 5V
DISC TABLE IS OPEN: 0V
WHEN LOAD IN OPERATES: 5V
WHEN LOAD OUT OPERATES: 5V
SLED ACCESS: 0V (TO THE INNER GROOVE)
SLED ACCESS TO THE OUTER GROOVE: 0.4V
SLED ACCESS TO THE INNER GROOVE: -0.4V
TO BASE UNIT ②
TO BASE UNIT ③
TO BASE UNIT ④
TO BASE UNIT ⑤
INPUT
STOP (RESET)
PAUSE
PLAY
(INDEX)
AMS/RMS
(CHASSIS)
1-614-013
SONY


19 20 21 22 23 24 25 26 27 28 29 30 31 32 33
A B C D E F G H I J
【LINE OUT BOARD】
OUTPUT
LINE OUT
CNJ411 L
CNJ511 R
(CHASSIS)
【SIRCS BOARD】
CNP705 IN
CNP706 OUT
REMOTE
【H.P BOARD】
RV401,501 LEVEL
CNJ412 HEADPHONES
【ACC BOARD】
CNJ301 SUBCODE OUT
CDP-302, CDP-520ES
【P.SW BOARD】
AC IN CNP991
CNJ991 AC OUTLET (UNSWITCHED) 100W MAX
PT901 POWER TRANSFORMER
S901 POWER
【LAMP BOARD】(CDP-302 ONLY)
TO BASE UNIT ❹
TO BASE UNIT ❺
SLED ACCESS:8V (TO THE INNER GROOVE)
DISC TABLE IS OPEN:0V
WHEN LOAD OUT OPERATES:3V
WHEN LOAD IN OPERATES:-8.3V
WHEN LOAD OUT OPERATES:8.3V
SLED ACCESS(TO THE OUTER GROOVE):0.4V
SLED ACCESS(TO THE INNER GROOVE):-0.4V
SLED ACCESS:8.2V (TO THE INNER GROOVE)
IC Q D


BU-1 (BASE UNIT)
[RF BOARD]
[LASER SW BOARD]
[LOAD IN SW BOARD (1/2)]
[MAIN BOARD]
[ACC BOARD]
[BSL MOTOR BOARD]
[L.C SW BOARD]
[CHUCKING SW BOARD]
[CHUCKING MOTOR BOARD]
[LOADING MOTOR BOARD]
[LOAD IN SW BOARD (1/2)]
[LOAD OUT SW BOARD]
OPTICAL PICK-UP BLOCK
DETECTOR
LASER DIODE
DISC MOTOR
2-AXIS DEVICE
TRACKING COIL
FOCUS COIL
M53 SLED COIL
SE51 SENSOR COIL
FIRST SELECTION: 32mSEC
SIXTEENTH SELECTION: 62mSEC
36Vp-p
IC101 (1/2)
MIRROR AMP
PEAK HOLD
BOTTOM HOLD
MIRROR COMPARATOR
MIRROR HOLD AMP
CURRENT REFERENCE
VOLTAGE REFERENCE
FOCUS OK AMP
FOCUS OK COMPARATOR
RF AMP
FOCUS ERROR AMP
RF COMPARATOR
AUTO ASYMMETRY CONTROL AMP
TRACKING ERROR AMP
IC305 μPC4082 PLL
D302 KV1236Z
Q310 DTC114 SWITCH
DISC TABLE IS OPEN: 0V
IC305 μPC4082 LOWPASS FILTER
IC306 NJM4558 DISC MOTOR DRIVE
Q309 2SC2785 INVERTER
CNJ301 SUBCODE OUT
IC307 CX23035 DIGITAL SIGNAL PROCESSOR/CLV SERVO
IC309 CX23034 DIGITAL FILTER
PHASE COMPARATOR
SUB-CODE SYNC DET
SUB-CODE DECODER
CRC CHECK
LATCH
EDGE DET
23BIT SHIFT REGISTER
EFM DECODER
FRAME SYNC DET, PROTECTION AND INTERPOLATION
TIMING GENERATOR FROM VCO
INTERPOLATION
PARALLEL/SERIAL CONVERTER
ERROR DET, ERROR CORRECTION
TIMING GENERATOR FROM X'TAL
CLV CONTROL
SPEED SERVO
PHASE SERVO
HIGH SPEED ACCESS SERVO
CPU INTERFACE
TRACKING COUNTER
RAM ADDRESS GENERATOR
SHIFTER (S/P)
WRITE DATA 16BIT×96W RAM
READ DATA
IC308 MB8416 RAM
DECODER
2048×8 (16384) RAM CELL
SELECTOR
D201 HZ5CLL
IC151 M5218L
Q151, 153 2SD774
Q152, 154 2SB734
DISC MOTOR DRIVE
IC201 CX20108 FOCUS/TRACKING/SLED SERVO
FOCUS SEARCH ON/OFF
FOCUS SEARCH UP/DOWN
COMPARATOR
FOCUS AMP
FOCUS ON/OFF
FOCUS GAIN DOWN/NORMAL
WINDOW COMPARATOR
LOGIC
LATCH
8BIT SHIFT REGISTER
ADDRESS DECODE
LEVEL CONVERTER TTL-I²L
TRACKING AMP
TRACKING (BRAKE) SERVO ON/CHOP
TRACKING GAIN UP/NORMAL
TRACKING (SERVO) ON/OFF
SLED AMP
SLED ON/OFF
Q201 2SD774
Q202 2SB734
FOCUS COIL DRIVE
Q209 2SA1115 INVERTER
Q210 2SC2001 SLED GAIN SWITCH
Q203 2SD774, Q204 2SB734 TRACKING COIL DRIVE
Q205 2SD774, Q206 2SB734 SLED COIL DRIVE
IC202 μPC4558 SLED COIL DRIVE/LIMIT IN DET
D202 1SS119
(SLED ACCESS (TO THE OUTER GROOVE): 0.4V)
(SLED ACCESS (TO THE INNER GROOVE): -0.4V)
D301 1SS119
D213 RD2.7
Q211, 212 DTC143 MUTING
Q213 DTC114 SWITCH
Q303, 304 DTC114 INVERTER
D211, 205 1SS119
IC303 MSM6404A-39RS MECHA CONTROL
(SLED ACCESS: 8V (TO THE INNER GROOVE))
(SLED ACCESS: 4V)
WHEN LOAD IN OPERATES: 5V
WHEN LOAD OUT OPERATES: 5V
WHEN LOAD IN OPERATES: -8V
WHEN LOAD OUT OPERATES: 8V
WHEN LOAD IN OPERATES: -7.6V
WHEN LOAD OUT OPERATES: 7.6V
WHEN LOAD OUT OPERATES: 2.6V
Q305, 306 DTC114 INVERTER
WHEN LOAD IN OPERATES: -8.3V
WHEN LOAD OUT OPERATES: 8.3V
Q301 2SD744
Q302 2SB734
LOADING DRIVE
IC306 NJM4558 LOADING DRIVE
D651, 652 10E2
D653 10E2
S653 MOTOR SELECT
S654 CHUCKING
LOADING SIDE
CHUCKING SIDE
M651 CHUCKING
M652 LOADING
S651 LOAD IN DET
S652 LOAD OUT DET
(ON: DISC TABLE IS CLOSED.)
(OFF: DISC TABLE IS CLOSED.)
IC851 HEAD AMP
LIMITER AMP
ABLC
D851 REMOTE SENSOR
PH3
S656 LASER ON
S655 LESER ON
(ON: DISCTABLE IS CLOSED.)
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A
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C
D
E
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G
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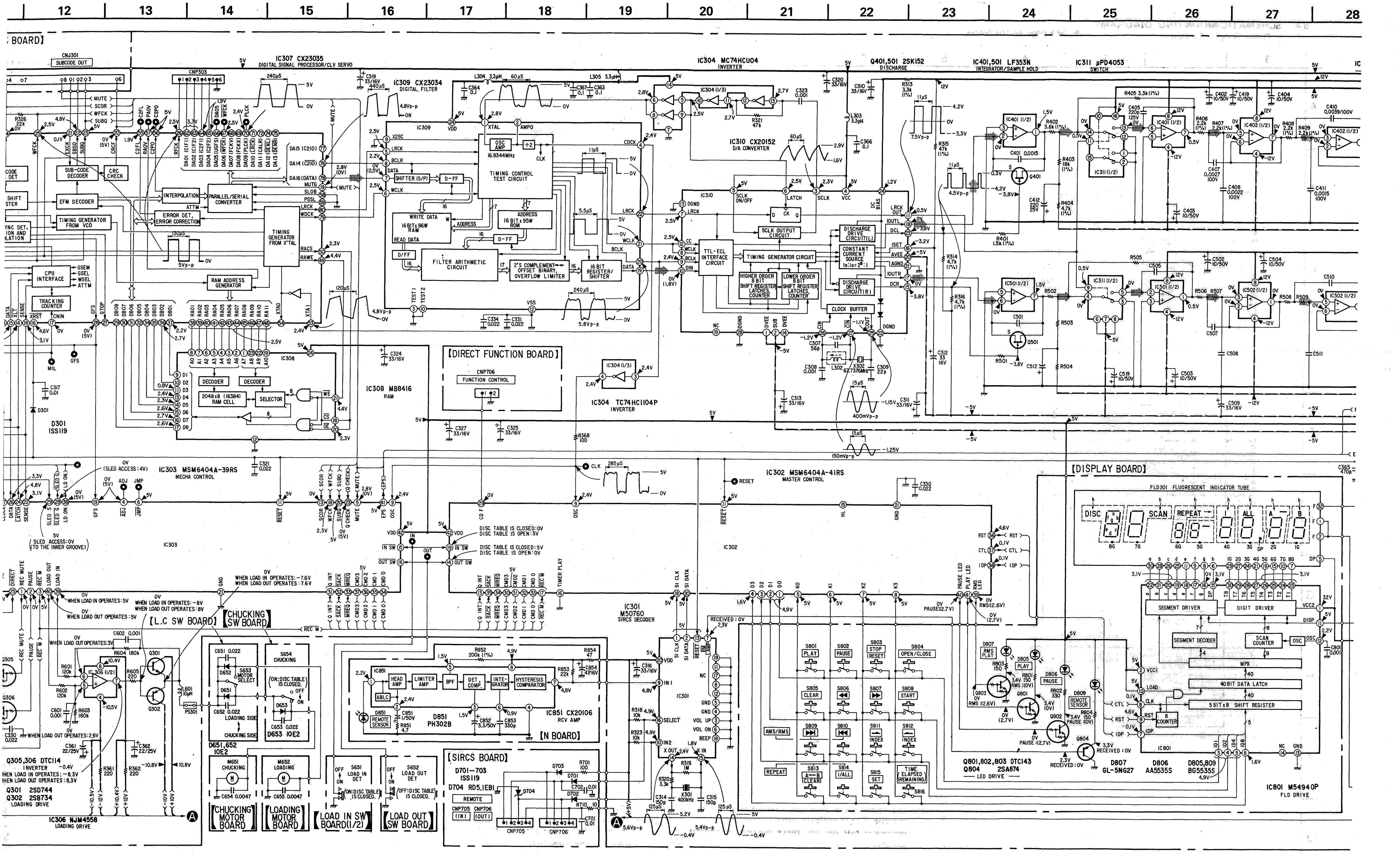
12
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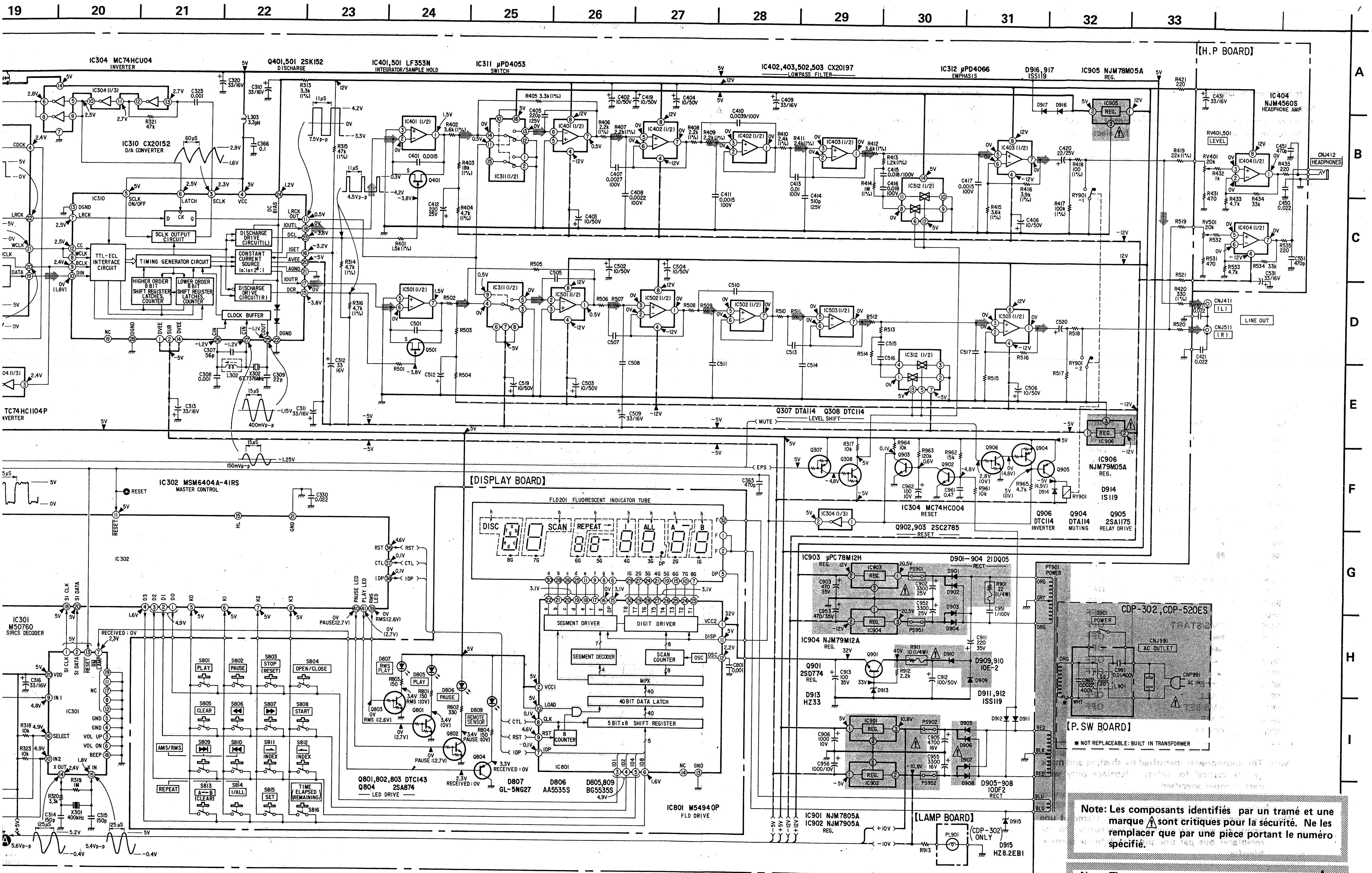
28
BOARD】
IC307 CX23035
DIGITAL SIGNAL PROCESSOR/CLV SERVO
IC309 CX23034
DIGITAL FILTER
IC304 MC74HCU04
INVERTER
Q401,501 2SK152
DISCHARGE
IC401,501 LF353N
INTEGRATOR/SAMPLE HOLD
IC311 μPD4053
SWITCH
CNJ301
SUBCODE OUT
CNP303
SUB-CODE DECODER
CRC CHECK
EFM DECODER
INTERPOLATION
PARALLEL/SERIAL CONVERTER
ERROR DET, ERROR CORRECTION
TIMING GENERATOR FROM VCO
TIMING GENERATOR FROM X'TAL
CPU INTERFACE
TRACKING COUNTER
RAM ADDRESS GENERATOR
OSC AMP
16.9344MHz
TIMING CONTROL TEST CIRCUIT
SHIFTER (S/P)
D-FF
WRITE DATA 16 BIT×96W RAM
ADDRESS 16 BIT×95W ROM
FILTER ARITHMETIC CIRCUIT
2'S COMPLEMENT→ OFFSET BINARY, OVERFLOW LIMITER
16 BIT REGISTER/SHIFTER
IC310 CX20152
D/A CONVERTER
TTL-ECL INTERFACE CIRCUIT
SCLK OUTPUT CIRCUIT
TIMING GENERATOR CIRCUIT
HIGHER ORDER 8 BIT SHIFT REGISTER LATCHES, COUNTER
LOWER ORDER 8 BIT SHIFT REGISTER LATCHES, COUNTER
DISCHARGE DRIVE CIRCUIT(L)
CONSTANT CURRENT SOURCE
DISCHARGE DRIVE CIRCUIT(R)
CLOCK BUFFER
X302 6.7376MHz
IC308
IC308 MB8416
RAM
DECODER
2048×8 (16384) RAM CELL
SELECTOR
D301
1SS119
【DIRECT FUNCTION BOARD】
CNP706
FUNCTION CONTROL
IC304 (1/3)
IC304 TC74HC1104P
INVERTER
IC303 MSM6404A-39RS
MECHA CONTROL
IC302 MSM6404A-41RS
MASTER CONTROL
RESET
CLK
SLED ACCESS:0V (TO THE INNER GROOVE)
DISC TABLE IS CLOSED:0V
DISC TABLE IS OPEN:5V
DISC TABLE IS CLOSED:5V
DISC TABLE IS OPEN:0V
WHEN LOAD IN OPERATES:-7.6V
WHEN LOAD OUT OPERATES:7.6V
WHEN LOAD IN OPERATES:5V
WHEN LOAD IN OPERATES:-8V
WHEN LOAD OUT OPERATES:8V
WHEN LOAD OUT OPERATES:5V
【L.C SW BOARD】
【CHUCKING SW BOARD】
S653 MOTOR SELECT
S654 CHUCKING
(ON:DISC TABLE IS CLOSED.)
LOADING SIDE
D651,652 10E2
D653 10E2
M651 CHUCKING
M652 LOADING
【CHUCKING MOTOR BOARD】
【LOADING MOTOR BOARD】
S651 LOAD IN DET
【LOAD IN SW BOARD(1/2)】
S652 LOAD OUT DET
(OFF:DISC TABLE IS CLOSED.)
【LOAD OUT SW BOARD】
IC306 (1/2)
Q301 2SD744
Q302 2SB734
LOADING DRIVE
Q305,306 DTC114
INVERTER
WHEN LOAD IN OPERATES:-8.3V
WHEN LOAD OUT OPERATES:8.3V
IC306 NJM4558
LOADING DRIVE
IC851
HEAD AMP
LIMITER AMP
BPF
DET COMP.
INTEGRATOR
HYSTERESIS COMPARATOR
ABLC
D851 REMOTE SENSOR
D851 PH302B
IC851 CX20106
RCV AMP
【N BOARD】
【SIRCS BOARD】
D701-703 1SS119
D704 RD5.1EB1
REMOTE
CNP705 (IN)
CNP706 (OUT)
IC301 M50760
SIRCS DECODER
X301 400kHz
【DISPLAY BOARD】
FLD201 FLUORESCENT INDICATOR TUBE
DISC
SCAN
REPEAT
ALL
A
B
S801 PLAY
S802 PAUSE
S803 STOP (RESET)
S804 OPEN/CLOSE
S805 CLEAR
S806
S807
S808 START
S809
S810
S811 INDEX
S812 INDEX
AMS/RMS
REPEAT
S813 A↔B (CLEAR)
S814 I/ALL
S815 SET
TIME ELAPSED (REMAINING)
S816
D807 RMS PLAY
D805 PLAY
D806 PAUSE
D809 REMOTE SENSOR
Q801,802,803 DTC143
Q804 2SA874
LED DRIVE
D807 GL-5NG27
D806 AA5535S
D805,809 BG5535S
RECEIVED:0V
SEGMENT DRIVER
DIGIT DRIVER
SEGMENT DECODER
SCAN COUNTER
OSC
MPX
40 BIT DATA LATCH
5 BIT×8 SHIFT REGISTER
8 COUNTER
IC801
IC801 M54940P
FLD DRIVE


IC304 MC74HCU04 INVERTER
IC310 CX20152 D/A CONVERTER
Q401,501 2SK152 DISCHARGE
IC401,501 LF353N INTEGRATOR/SAMPLE HOLD
IC311 μPD4053 SWITCH
IC402,403,502,503 CX20197 LOWPASS FILTER
IC312 μPD4066 EMPHASIS
D916, 917 ISS119
IC905 NJM78M05A REG.
[H.P BOARD]
IC404 NJM4560S HEADPHONE AMP.
RV401,501 LEVEL
CNJ412 HEADPHONES
CNJ411 (L)
CNJ511 (R)
LINE OUT
TTL-ECL INTERFACE CIRCUIT
TIMING GENERATOR CIRCUIT
SCLK OUTPUT CIRCUIT
HIGHER ORDER 8 BIT SHIFT REGISTER LATCHES, COUNTER
LOWER ORDER 8 BIT SHIFT REGISTER LATCHES, COUNTER
DISCHARGE DRIVE CIRCUIT(L)
CONSTANT CURRENT SOURCE Io:Io=2^8:1
DISCHARGE DRIVE CIRCUIT(R)
CLOCK BUFFER
TC74HC1104P INVERTER
Q307 DTA114 Q308 DTC114 LEVEL SHIFT
IC906 NJM79M05A REG.
D914 IS119
IC304 MC74HC004 RESET
Q902,903 2SC2785 RESET
Q906 DTC114 INVERTER
Q904 DTA114 MUTING
Q905 2SA1175 RELAY DRIVE
IC302 MSM6404A-41RS MASTER CONTROL
[DISPLAY BOARD]
FLD201 FLUORESCENT INDICATOR TUBE
DISC SCAN REPEAT ALL A B
SEGMENT DRIVER
DIGIT DRIVER
SEGMENT DECODER
SCAN COUNTER
MPX
40BIT DATA LATCH
5BITx8 SHIFT REGISTER
8 COUNTER
IC801 M54940P FLD DRIVE
IC301 M50760 SIRCS DECODER
S801 PLAY
S802 PAUSE
S803 STOP (RESET)
S804 OPEN/CLOSE
S805 CLEAR
S806 ◀◀
S807 ▶▶
S808 START
S809 ▶▶|
S810 |◀◀
S811 INDEX
S812 INDEX
S813 A↔B (CLEAR)
S814 I/ALL
S815 SET
S816 TIME (ELAPSED/REMAINING)
AMS/RMS
REPEAT
D807 RMS PLAY
D805 PLAY
D806 PAUSE
D809 REMOTE SENSOR
Q801,802,803 DTC143
Q804 2SA874
LED DRIVE
D807 GL-5NG27
D806 AA5535S
D805,809 BG5535S
IC903 μPC78M12H REG.
IC904 NJM79M12A REG.
D901–904 21DQ05 RECT
PT901 POWER
Q901 2SD774 REG.
D913 HZ33
D909,910 10E-2
D911,912 ISS119
IC901 NJM7805A
IC902 NJM7905A REG.
D905–908 10DF2 RECT
[LAMP BOARD]
PL901 (CDP-302) ONLY
D915 HZ8.2EB1
CDP-302, CDP-520ES
S901 POWER
CNJ991 AC OUTLET
CNP991 AC IN
[P.SW BOARD]
※ NOT REPLACEABLE: BUILT IN TRANSFORMER

Note: Les composants identifiés par un tramé et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Note on Schematic Diagram:

Note:

- All capacitors are in μF unless otherwise noted. pF: μμF 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4 W or less unless otherwise specified.
- ⇨ : signal path.
- Components for right channel have same values as for left channel.
- ▭ : nonflammable resistor.
- ▬▬ : B+ bus.
- ▬▬▬ : B– bus.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken under no-signal conditions with a VOM (50 kΩ/V).
  no mark: STOP
  ( ): PLAY
- Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken to ground under no-signal conditions by using oscilloscope.
  Voltage variations may be noted due to normal production tolerances.
- **Switch**

Ref. No.	Switch	Position
S651	LOAD IN DET	ON
S652	LOAD OUT DET	OFF
S653	MOTOR SELECT	CHUCKING SIDE
S654	CHUCKING	ON
S655	LASER ON (CHUCKING SIDE)	ON
S656	LASER ON (LOADING SIDE)	ON
S801	▶	OFF
S802	❚❚	OFF
S803	STOP	OFF
S804	OPEN/CLOSE	OFF
S805	CLEAR	OFF
S806		OFF
S807		OFF
S808	RMS/START	OFF
S809	▶▶❘	OFF
S810	❘◀◀	OFF
S811	→	OFF
S812	←	OFF
S813	A↔B	OFF
S814	I/ALL	OFF
S815	RMS/SET	OFF
S816	TIME	OFF
S991	POWER	OFF

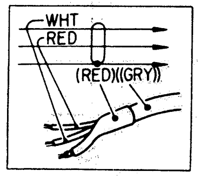
Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par un tramé et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

Note on Mounting Diagram:

Note:

- Color code of sleeving over the end of the jacket.

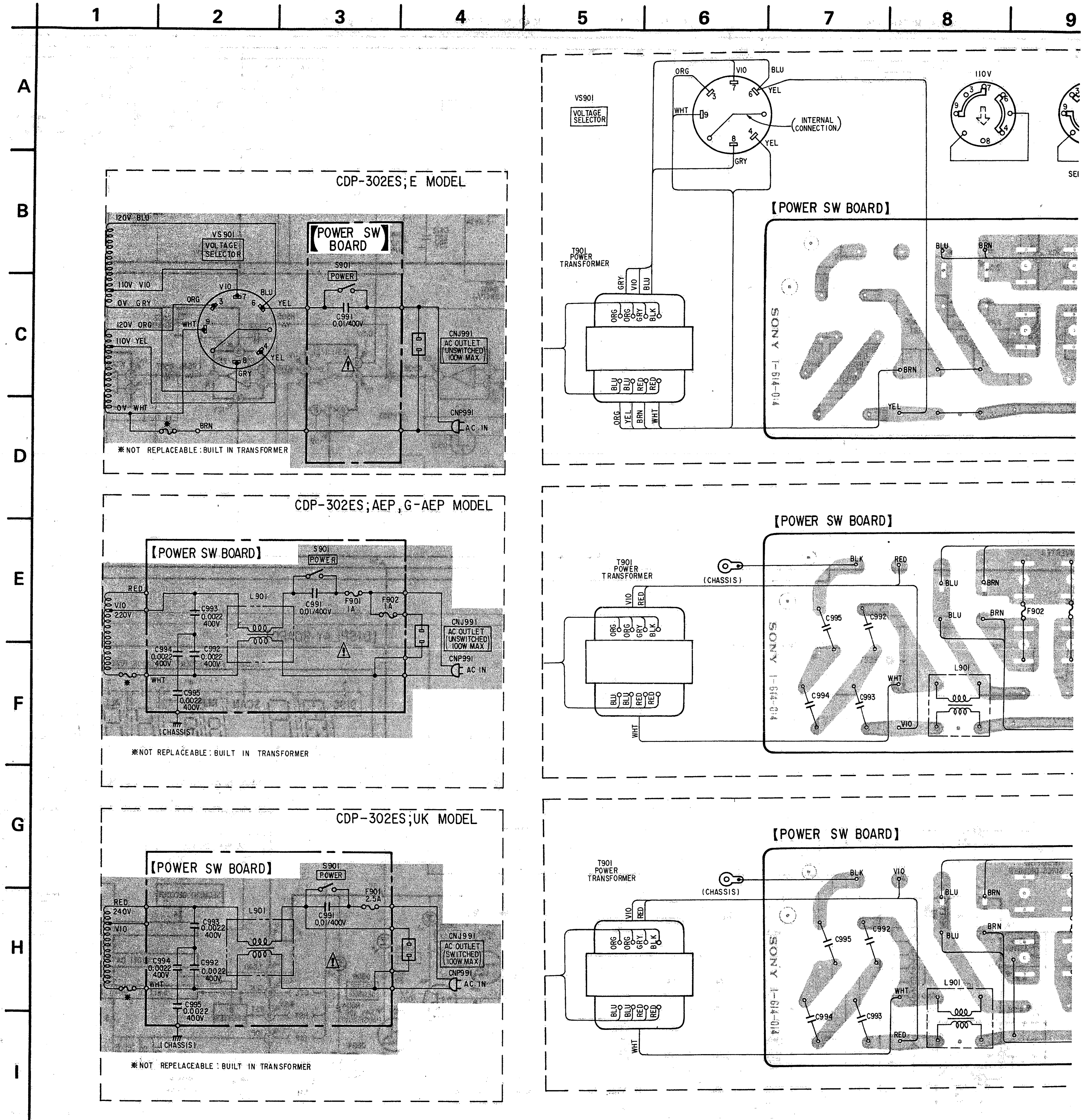

WHT
RED
(RED)((GRY))

- o—— : parts extracted from the component side.
- •—— : parts extracted from the conductor side.
- ⬚⟵ : indicates side identified with part number.
- ━━▶━━ : signal path
- ━━ ━▶ : L-CH signal path
- ━━··━▶ : R-CH signal path
- ▒ : B + pattern

5-4. SCHEMATIC/MOUNTING DIAGRAMS

– Power Supply Section –

- See page 44 for Notes.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3
4
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7
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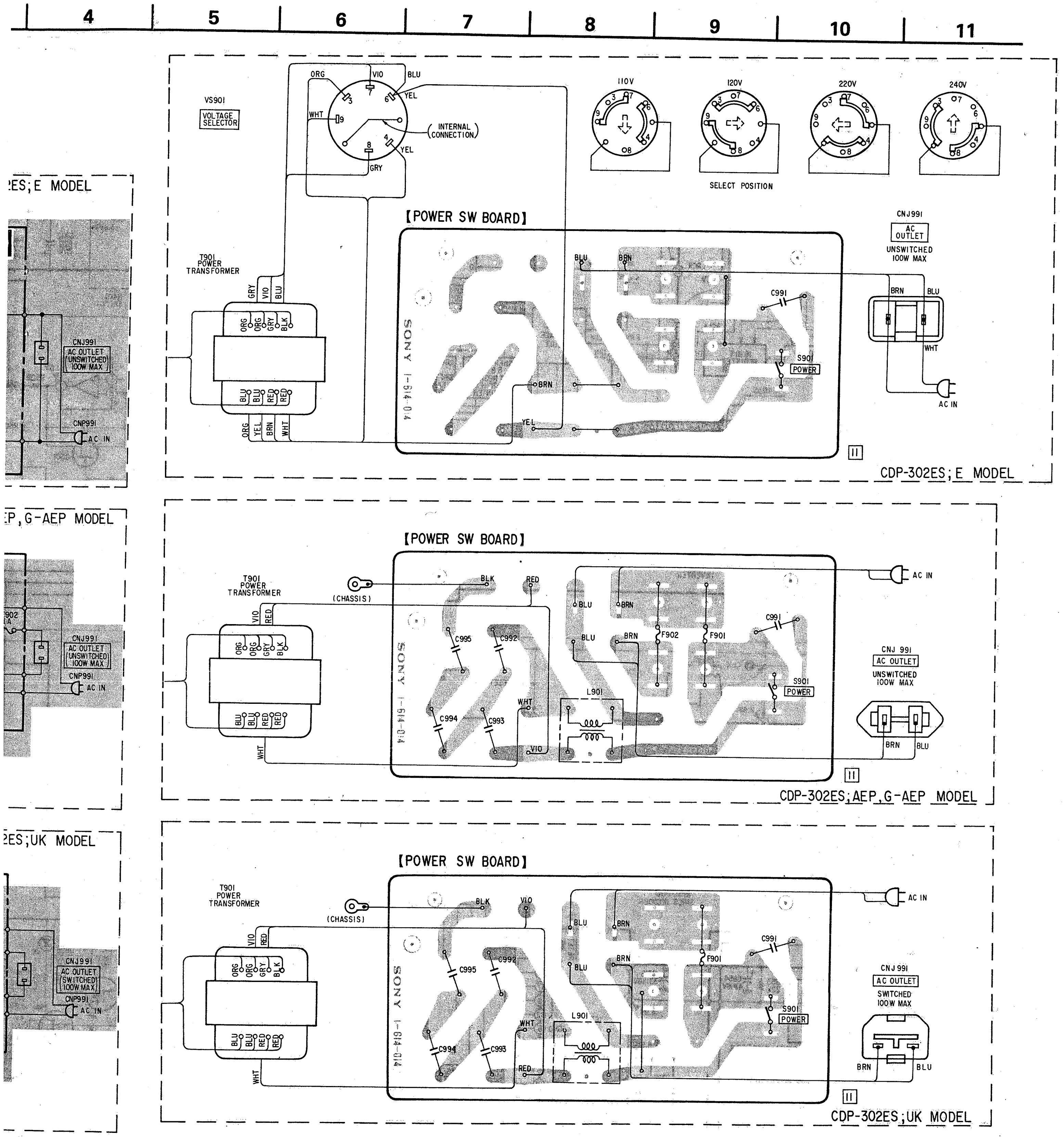
9
A
B
C
D
E
F
G
H
I
J
CDP-302ES;E MODEL
120V BLU
VS901
VOLTAGE SELECTOR
110V VIO
0V GRY
120V ORG
110V YEL
0V WHT
VIO
ORG
BLU
WHT
YEL
GRY
BRN
[POWER SW BOARD]
S901
POWER
C991
0.01/400V
CNJ991
AC OUTLET (UNSWITCHED) 100W MAX
CNP991
AC IN
※NOT REPLACEABLE: BUILT IN TRANSFORMER
CDP-302ES;AEP,G-AEP MODEL
[POWER SW BOARD]
RED
VIO
220V
WHT
C993 0.0022 400V
C994 0.0022 400V
C992 0.0022 400V
C995 0.0022 400V
L901
F901 1A
F902 1A
(CHASSIS)
CNJ991
AC OUTLET (UNSWITCHED) 100W MAX
CNP991
AC IN
※NOT REPLACEABLE: BUILT IN TRANSFORMER
CDP-302ES;UK MODEL
[POWER SW BOARD]
RED
240V
VIO
WHT
C993 0.0022 400V
C994 0.0022 400V
C992 0.0022 400V
C995 0.0022 400V
L901
S901
POWER
C991 0.01/400V
F901 2.5A
CNJ991
AC OUTLET (SWITCHED) 100W MAX
CNP991
AC IN
(CHASSIS)
※NOT REPELACEABLE: BUILT IN TRANSFORMER
VS901
VOLTAGE SELECTOR
ORG
VIO
BLU
YEL
WHT
GRY
(INTERNAL CONNECTION)
110V
T901 POWER TRANSFORMER
GRY
VIO
BLU
ORG
ORG
GRY
BLK
BLU
BLU
RED
RED
ORG
YEL
BRN
WHT
[POWER SW BOARD]
SONY 1-614-014
BLU
BRN
YEL
(CHASSIS)
F902
C995
C992
C994
C993
L901
VIO
SE

Note: Les composants identifiés par un tramé et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

Note: The
⚠
part

See page 44 for Notes.


4
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VS901
VOLTAGE SELECTOR
ORG
VIO
BLU
YEL
WHT
GRY
INTERNAL CONNECTION
110V
120V
220V
240V
SELECT POSITION
T901 POWER TRANSFORMER
【POWER SW BOARD】
SONY 1-614-014
CNJ991 AC OUTLET UNSWITCHED 100W MAX
BRN
RED
BLK
C991
S901 POWER
AC IN
CDP-302ES;E MODEL
(CHASSIS)
C992
C993
C994
C995
F901
F902
L901
CNJ 991 AC OUTLET UNSWITCHED 100W MAX
CDP-302ES;AEP,G-AEP MODEL
CNJ 991 AC OUTLET SWITCHED 100W MAX
CDP-302ES;UK MODEL
CNP991
ES;E MODEL
P,G-AEP MODEL
ES;UK MODEL

Note: Les composants identifiés par un tramé et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

SECTION 6

EXPLODED VIEWS AND PARTS LIST

NOTE:

- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked " ★ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The construction parts of an assembled part are indicated with a collation number on the remark column.

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

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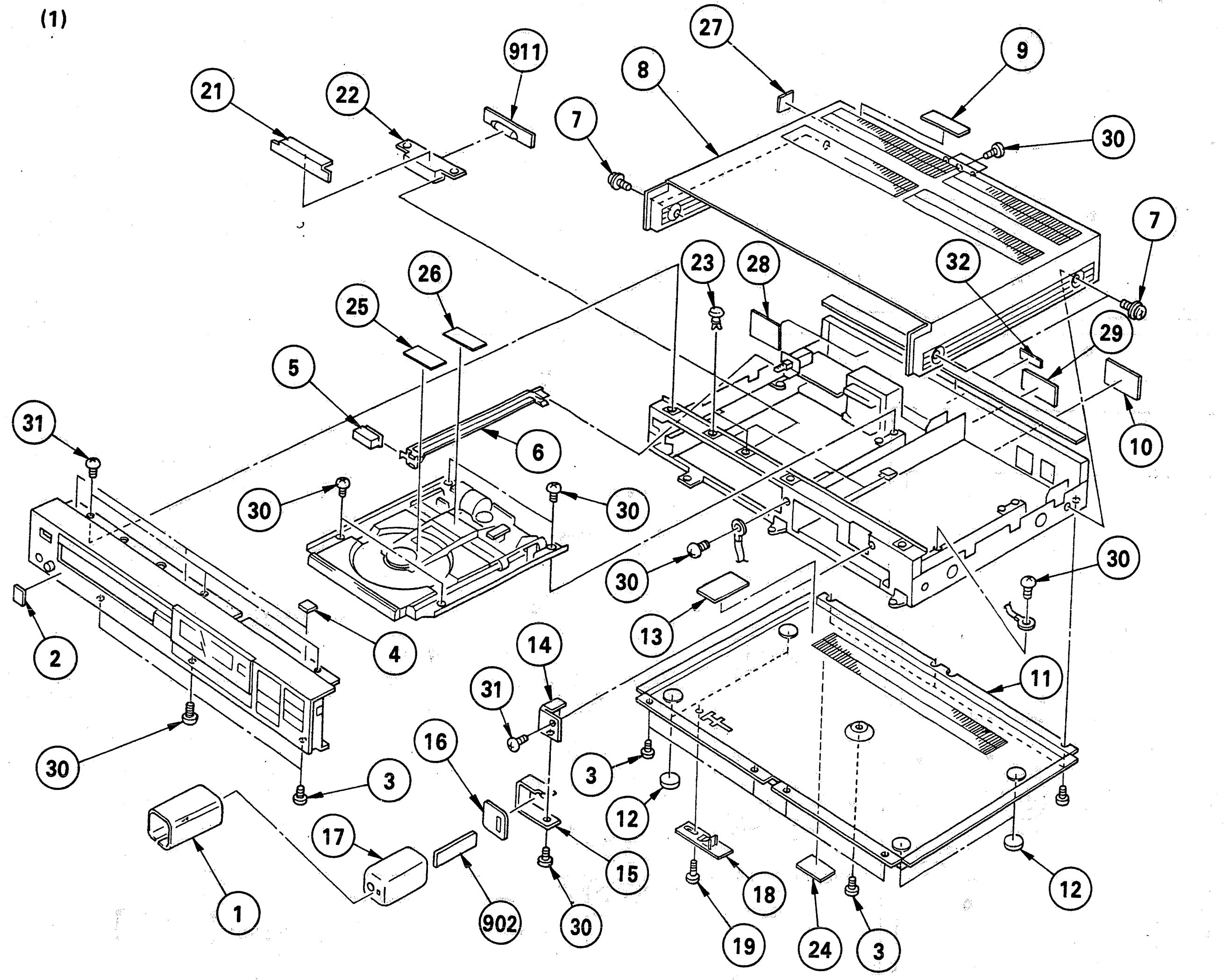
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28
29
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31
32
902
911

No.	Part No.	Description	REMARKS
1	*4-884-637-00	SHEET (C), INSULATING	
2	3-703-710-41	(302ES,520ES)...STICKER, SONY SYMBOL(12)	
3	3-703-685-21	SCREW (+BV 3X8)	
4	9-911-840-XX	CUSHION	
5	3-318-911-11	KNOB (POWER.L), T MOLD	
6	*4-908-425-01	LEVER, POWER SWITCH	
7	4-889-321-31	SCREW	
8	4-908-438-01	CASE	
9	4-885-831-00	LABEL, CAUTION	
10	*4-908-449-01	(302)..........LABEL, MODEL NUMBER (U)	
	*4-908-450-01	(520ES)........LABEL, MODEL NUMBER (U)	
	*4-908-453-01	(302ES;AEP)....LABEL, MODEL NUMBER (AE1)	
	*4-908-455-01	(302ES;UK).....LABEL, MODEL NUMBER (UK)	
	*4-908-457-01	(302ES;E)......LABEL, MODEL NUMBER (E2/3)	
	*4-908-463-01	(302ES;G-AEP)..LABEL, MODEL NUMBER (AE4)	
11	*4-908-439-01	(302)..........PLATE, BOTTOM	
	*4-908-439-11	(302ES,520ES)..PLATE, BOTTOM	
12	4-887-290-00	LEG, RUBBER	
13	*4-908-447-01	SHEET, INSULATING	
14	*4-908-409-01	BRACKET, REMOTE CONTROL	
15	*4-908-408-01	PLATE, FIXED, CATCHER, RAY	
16	*4-342-118-00	LID, SHIELD CASE, R	
17	*4-342-117-00	CASE, SHIELD (MAIN), R	
18	*4-908-600-01	LEVER, LOCK, TRANSPORT	
19	3-323-470-01	SCREW (B3X6), (+ -)	
20	3-831-441-XX	CUSHION	
21	*4-908-459-01	(302)...PLATE, LIGHT INTERCEPTION	
22	*4-908-458-01	(302)...BRACKET, LAMP	
23	4-812-134-00	(302)...RIVET NYLON, 3.5	
24	3-703-079-21	(302ES; UK)....LABEL, CAUTION (BACK)	
	*3-703-680-00	(302,520ES)...LABEL, CAUTION, SUB, NEW UL	
25	4-908-404-01	(302ES)...LABEL, APARTURTE, LASER, DHHS	
26	4-908-402-01	(302,520ES)...LABEL, INTERLOCK, DHHS	
27	4-908-401-01	(302,520ES)...LABEL, HOUSING, DHHS	
28	4-885-843-02	(302ES)...LABEL, CAUTION, LASER	
29	*4-885-838-01	(302ES)...LABEL, CLASS 1	
30	7-685-751-09	SCREW +BVTT 3X6 (S)	
31	7-685-872-09	SCREW +BVTT 3X8 (S)	
32	*4-884-680-00	(302; Canadian)...LABEL	
902	*1-611-717-11	PC BOARD, N	
911	*1-614-017-11	(302).....PC BOARD, LAMP	

SECTION 6

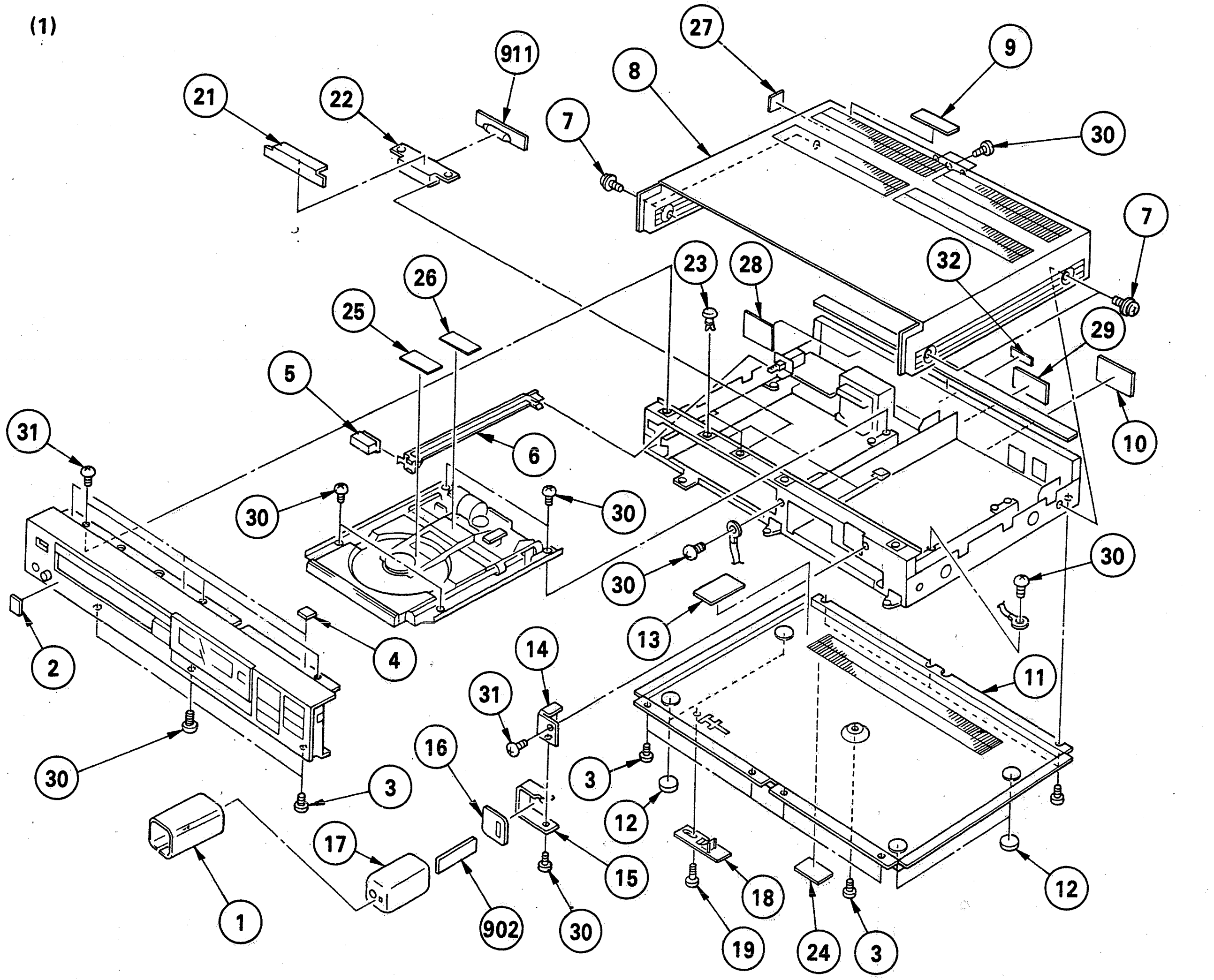
EXPLODED VIEWS AND PARTS LIST

NOTE:
- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked " ★ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The construction parts of an assembled part are indicated with a collation number on the remark column.

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

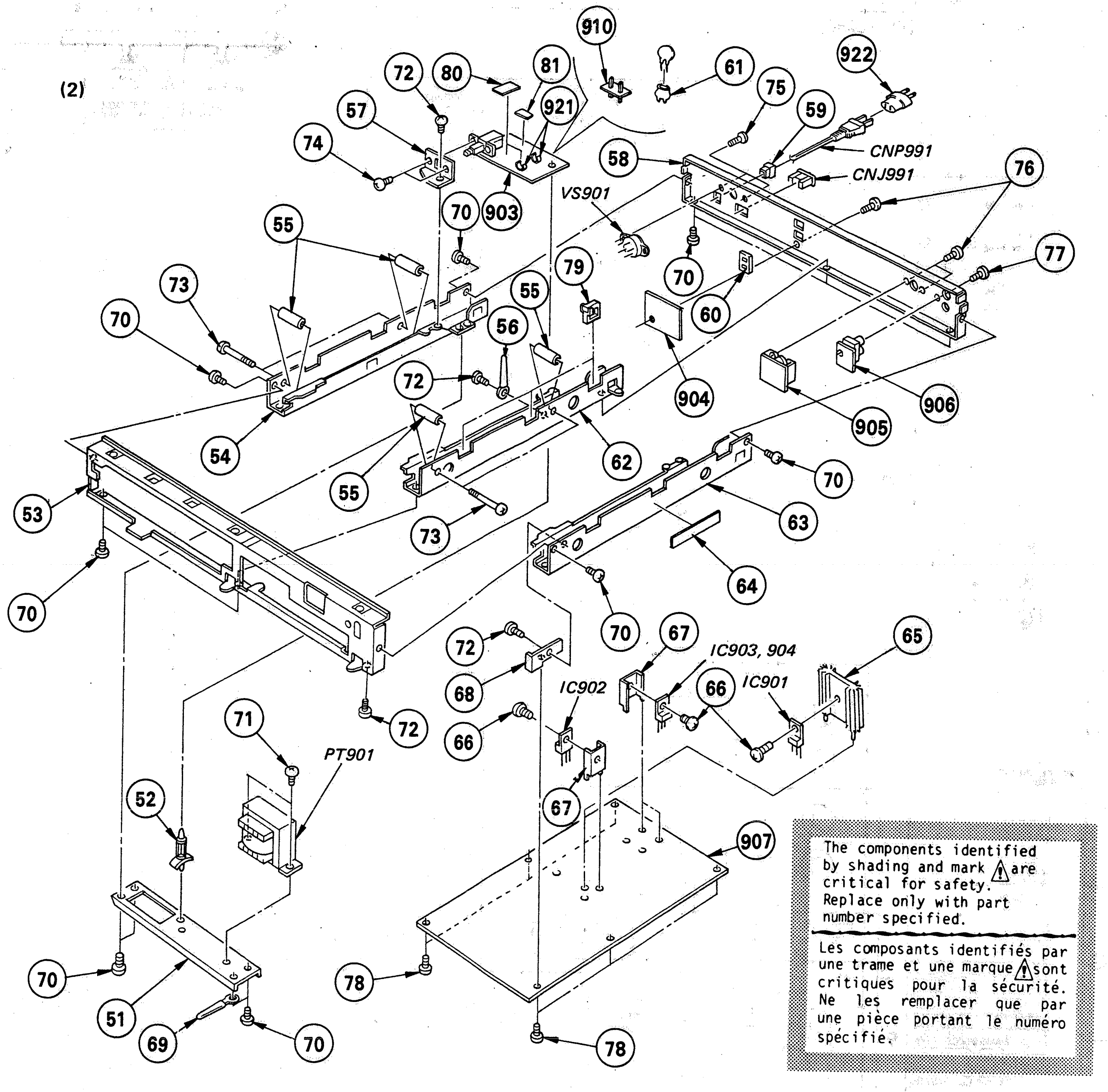
(1)



No.	Part No.	Description	REMARKS
1	*4-884-637-00	SHEET (C), INSULATING	
2	3-703-710-41	(302ES,520ES)...STICKER, SONY SYMBOL(12)	
3	3-703-685-21	SCREW (+BV 3X8)	
4	9-911-840-XX	CUSHION	
5	3-318-911-11	KNOB (POWER.L), T MOLD	
6	*4-908-425-01	LEVER, POWER SWITCH	
7	4-889-321-31	SCREW	
8	4-908-438-01	CASE	
9	4-885-831-00	LABEL, CAUTION	
10	*4-908-449-01	(302)..........LABEL, MODEL NUMBER (U)	
	*4-908-450-01	(520ES)........LABEL, MODEL NUMBER (U)	
	*4-908-453-01	(302ES;AEP)....LABEL, MODEL NUMBER (AE1)	
	*4-908-455-01	(302ES;UK).....LABEL, MODEL NUMBER (UK)	
	*4-908-457-01	(302ES;E)......LABEL, MODEL NUMBER (E2/3)	
	*4-908-463-01	(302ES;G-AEP)..LABEL, MODEL NUMBER (AE4)	
11	*4-908-439-01	(302)..........PLATE, BOTTOM	
	*4-908-439-11	(302ES,520ES)..PLATE, BOTTOM	
12	4-887-290-00	LEG, RUBBER	
13	*4-908-447-01	SHEET, INSULATING	
14	*4-908-409-01	BRACKET, REMOTE CONTROL	

No.	Part No.	Description	REMARKS
15	*4-908-408-01	PLATE, FIXED, CATCHER, RAY	
16	*4-342-118-00	LID, SHIELD CASE, R	
17	*4-342-117-00	CASE, SHIELD (MAIN), R	
18	*4-908-600-01	LEVER, LOCK, TRANSPORT	
19	3-323-470-01	SCREW (B3X6), (+ -)	
20	3-831-441-XX	CUSHION	
21	*4-908-459-01	(302)...PLATE, LIGHT INTERCEPTION	
22	*4-908-458-01	(302)...BRACKET, LAMP	
23	4-812-134-00	(302)...RIVET NYLON, 3.5	
24	3-703-079-21	(302ES; UK)....LABEL, CAUTION (BACK)	
	*3-703-680-00	(302,520ES)...LABEL, CAUTION, SUB, NEW UL	
25	4-908-404-01	(302ES)...LABEL, APARTURTE, LASER, DHHS	
26	4-908-402-01	(302,520ES)...LABEL, INTERLOCK, DHHS	
27	4-908-401-01	(302,520ES)...LABEL, HOUSING, DHHS	
28	4-885-843-02	(302ES)...LABEL, CAUTION, LASER	
29	*4-885-838-01	(302ES)...LABEL, CLASS 1	
30	7-685-751-09	SCREW +BVTT 3X6 (S)	
31	7-685-872-09	SCREW +BVTT 3X8 (S)	
32	*4-884-680-00	(302; Canadian)...LABEL	
902	*1-611-717-11	PC BOARD, N	
911	*1-614-017-11	(302).....PC BOARD, LAMP	

(2)



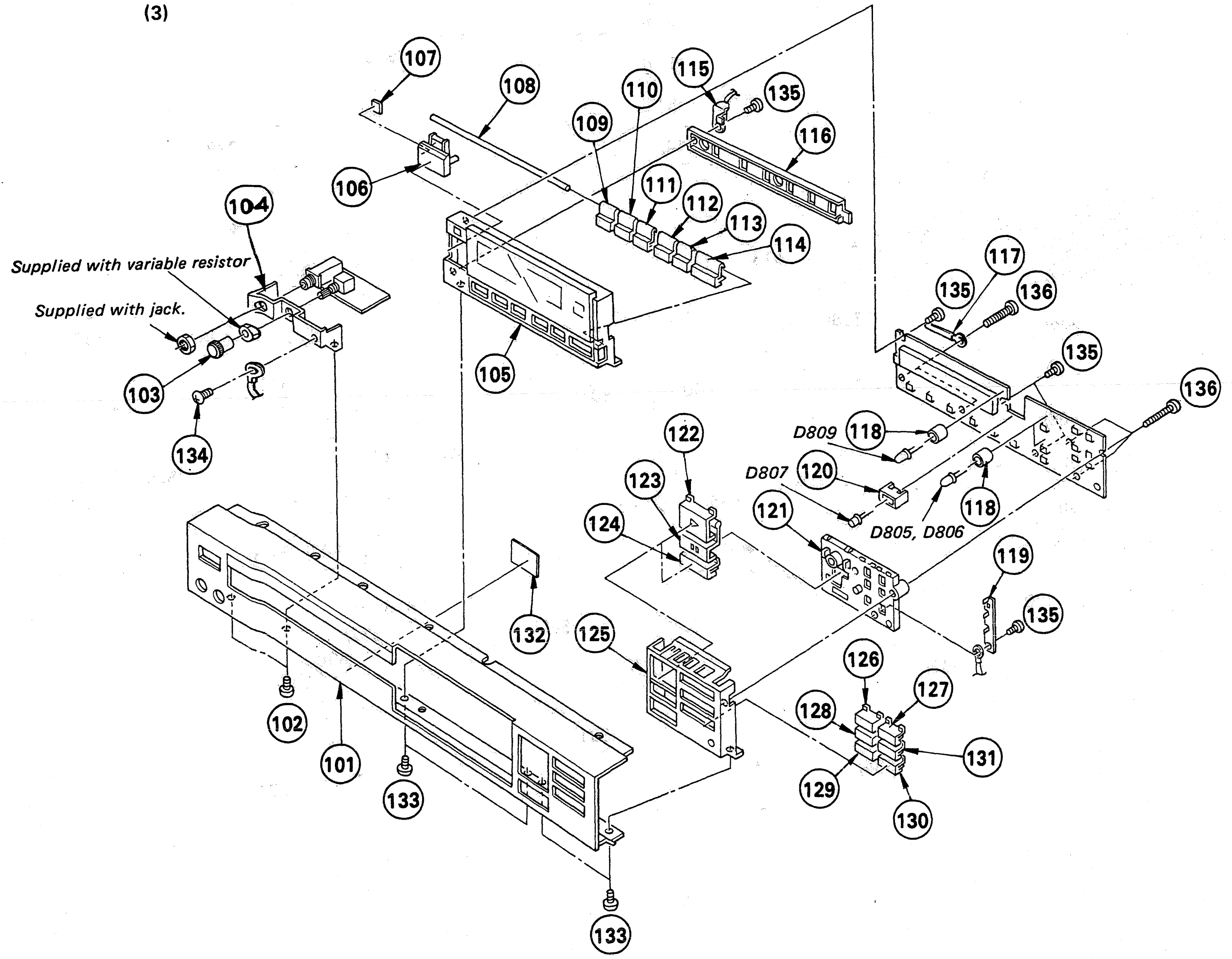
The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

No.	Part No.	Description	REMARKS
51	*4-908-424-01	BRACKET, TRANSFORMER	
52	*3-703-353-07	SUPPORT, PC BOARD	
53	*4-908-437-01	PANEL, SUB	
54	*4-908-432-01	FRAME (LEFT)	
55	*3-312-427-00	SPACER (3X22)	
56	3-701-822-00	HOLDER, WIRE	
57	*4-908-407-01	BRACKET, POWER SWITCH	
58	*4-908-444-01	(302; US)............PLATE, JACK	
	*4-908-444-11	(302; Canadian).......... PLATE, JACK	
	*4-908-444-51	(520ES).............PLATE, JACK	
	*4-908-444-61	(302ES;AEP,G-AEP)...PLATE, JACK	
	*4-908-444-71	(302ES;UK)..........PLATE, JACK	
	*4-908-444-81	(302ES;E)...........PLATE, JACK	
59	3-703-244-00	(302; Canadian, 302ES, 520ES)...BUSHING, CORD	
	3-703-571-11	(302; US).......BUSHING (S), CORD	
60	*3-322-818-01	HOLDER, CONNECTOR	
61	4-875-455-02	(302ES;AEP,G-AEP,UK)...CAVER (DIA 20), CAPACITOR	
62	*4-908-431-01	FRAME (INNER)	
63	*4-908-430-01	FRAME (RIGHT)	
64	*3-701-030-00	LABEL, SERIAL NUMBER	
65	*4-902-345-01	HEAT SINK	
66	2-259-121-00	SCREW, TR	
67	*4-908-502-01	HEAT SINK	

No.	Part No.	Description	REMARKS
68	*4-908-406-01	BRACKET, PC BOARD	
69	3-703-150-11	CLAMP	
70	7-685-872-09	SCREW +BVTT 3X8 (S)	
71	7-685-880-01	SCREW +BVTT 4X6 (S)	
72	7-685-751-09	SCREW +BVTT 3X6 (S)	
73	7-685-879-01	SCREW +BVTT 3X30 (S)	
74	7-682-147-09	SCREW +P 3X6	
75	7-621-775-20	SCREW +B 2.6X5	
76	7-685-134-19	SCREW +BTP 2.6X8 TYPE2 N-S	
77	3-703-473-00	SCREW, TERMINAL	
78	7-685-752-04	SCREW +BVTT 3X8 (S)	
79	4-308-840-00	HOLDER, WIRE	
80	*3-701-948-14	(302ES;AEP,GAEP)...LABEL, FUSE	
81	3-701-948-18	(302ES;UK).........LABEL, FUSE	
903	*1-614-014-11	PC BOARD, P.SW	
904	*1-614-016-11	PC BOARD, SIRCS	
905	*1-614-021-11	PC BOARD, ACC	
906	*1-614-019-11	PC BOARD, LINE OUT	
907	*A-4651-033-A	(302)...........MOUNTED PCB, MAIN	
	A-4651-034-A	(302ES,520ES)...MOUNTED PCB, MAIN	
921	1-533-131-00	(302ES;AEP,G-AEP,UK)...HOLDER, FUSE	
922	⚠ 1-526-565-00	(302ES;E)...AC PLUG ADAPTOR	

(3)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Supplied with variable resistor
Supplied with jack.
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No.	Part No.	Description	REMARKS
101	X-4908-410-1	(302ES)...FRONT PANEL ASSY	
	X-4908-411-1	(302).....FRONT PANEL ASSY	
	X-4908-413-1	(520ES)...FRONT PANEL ASSY	
102	3-703-108-21	SCREW +BV 3X6, S TIGHT	
103	4-902-067-11	KNOB, CONTROL	
104	*4-908-426-01	BRACKET, HEADPHONE	
105	X-4908-406-1	FROSTED PLATE HOLDER (B) ASSY	
106	X-4908-402-1	BUTTON (B) ASSY, OPEN/CLOSE	
107	9-911-844-XX	RUBBER, BRAKE	
108	4-908-412-01	SHAFT, BUTTON	
109	4-908-413-01	KNOB (A) (BLACK), T	
110	4-908-413-11	KNOB (A) (BLACK), T	
111	4-908-413-21	KNOB (A) (BLACK), T	
112	4-908-413-31	KNOB (A) (BLACK), T	
113	4-908-413-41	KNOB (A) (BLACK), T	
114	4-908-413-51	KNOB (A) (BLACK), T	
115	*4-908-446-01	PLATE, GROUND	
116	4-908-428-01	PLATE (A), SWITCH	
117	3-701-822-00	HOLDER, WIRE	
118	3-886-569-00	TUBE, RUBBER	

No.	Part No.	Description	REMARKS
119	4-908-423-01	SPACER, BUTTON	
120	4-908-554-01	HOLDER, LED	
121	4-908-429-01	PLATE (B), SWITCH	
122	X-4908-404-1	PLAY KNOB ASSY	
123	X-4908-405-1	PAUSE KNOB ASSY	
124	4-908-414-41	KNOB (B) (BLACK), T	
125	4-908-436-01	HOLDER, CONTROL BUTTON	
126	4-908-415-01	KNOB (AMS), T	
127	4-908-415-11	KNOB (AMS), T	
128	4-908-414-01	KNOB (B) (BLACK), T	
129	4-908-414-21	KNOB (B) (BLACK), T	
130	4-908-414-31	KNOB (B) (BLACK), T	
131	4-908-414-11	KNOB (B) (BLACK), T	
132	3-831-441-XX	CUSHION	
133	7-685-646-19	SCREW +BVTP 3X8 TYPE2 N-S	
134	7-685-751-09	SCREW +BVTT 3X6 (S)	
135	7-685-134-19	SCREW +BTP 2.6X8 TYPE2 N-S	
136	7-685-538-14	SCREW +BTP 2.6X16 TYPE2 N-S	
908	*1-614-015-11	PC BOARD, H.P	
909	*1-614-013-11	PC BOARD, DISPLAY	

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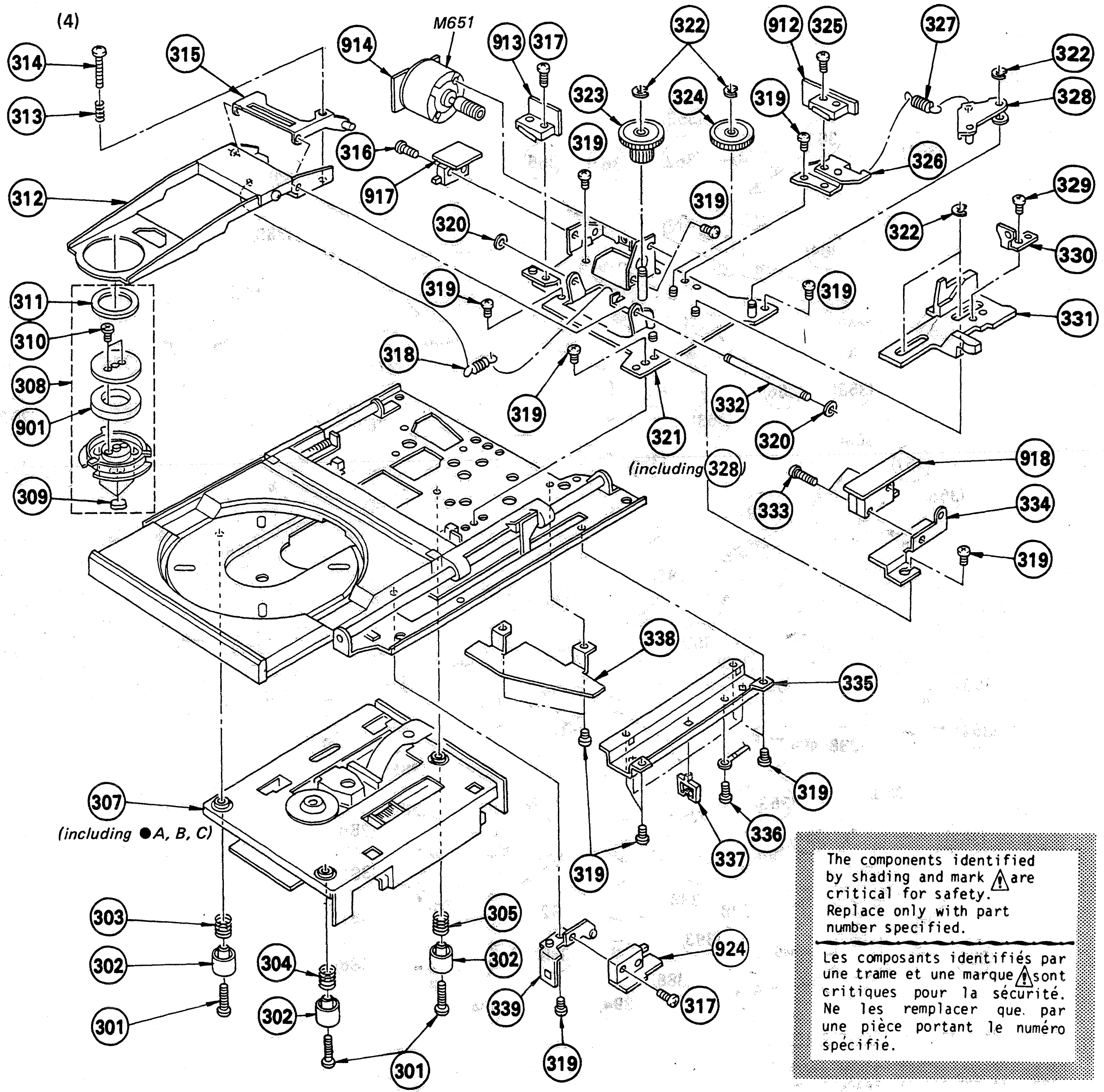
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The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

No.	Part No.	Description	REMARKS
301	7-682-553-09	SCREW +B 3X20	
302	4-908-592-01	POLE (A), INSULATOR	
303	4-908-594-01	SPRING, COMPRESSION	
304	4-908-595-01	SPRING, COMPRESSION	
305	4-908-596-01	SPRING, COMPRESSION	
307	⚠ X-4908-203-1	BU-1 (BASE UNIT)	
308	A-4675-077-A	PULLEY ASSY, PRESS	
309	4-908-537-01	FELT, PRESS	
310	4-908-618-01	SCREW (+BTP)(2X4)	
311	4-908-551-01	CUSHION	
312	*X-4908-510-1	ARM ASSY, C	
313	4-908-559-01	SPRING, COMPRESSION	
314	7-621-775-80	SCREW +B 2.6X16	
315	X-4908-513-1	PLATE ASSY, ADJUSTMENT, ARM	
316	7-685-864-01	SCREW +BVTT 2.6X10 (S)	
317	7-621-284-30	SCREW +P 2.6X8	
318	4-908-555-01	SPRING, TENSION (C ARM)	
319	7-621-259-10	SCREW +P 2.6X3	
320	3-558-708-21	WASHER, STOPPER	
321	*X-4908-509-1	CHASSIS ASSY, SUB	
322	7-624-106-04	STOP RING 3.0, TYPE -E	
323	4-908-528-01	GEAR (A)	
324	4-908-529-01	GEAR (B)	

No.	Part No.	Description	REMARKS
325	7-621-257-55	SCREW +P 2.3X8	
326	*4-908-522-01	BRACKET (B), SWITCH	
327	4-908-556-01	SPRING, TENSION (LOCK LEVER)	
328	*X-4908-504-1	LEVER ASSY, LOCK	
329	7-685-132-19	SCREW +BTP 2.6X8 TYPE2 N-S	
330	*4-908-521-01	PLATE, SWITCH	
331	4-908-570-01	CAM, C	
332	4-908-513-01	SHAFT, FULCRUM, C ARM	
333	7-621-259-80	SCREW +P 2.6X14	
334	*4-908-532-01	BRACKET (A), SWITCH	
335	*4-908-508-01	COVER, ROPE	
336	7-685-751-04	SCREW +PTT 3X6 (S)	
337	4-308-840-00	HOLDER, WIRE	
338	*4-908-597-01	COVER, BELT	
339	*4-908-541-01	BRACKET (C), SWITCH	
340	4-908-621-01	SHEET	
901	1-452-340-11	MAGNET	
912	*1-614-023-11	PC BOARD, L.C SW	
913	*1-614-024-11	PC BOARD, CHUCKING SW	
914	*1-614-025-11	PC BOARD, CHUCKING MOTOR	
917	*1-614-028-11	PC BOARD, LASER SW	
918	*1-614-029-11	PC BOARD, LOAD IN SW	
924	*1-614-030-11	PC BOARD, LOAD OUT SW	

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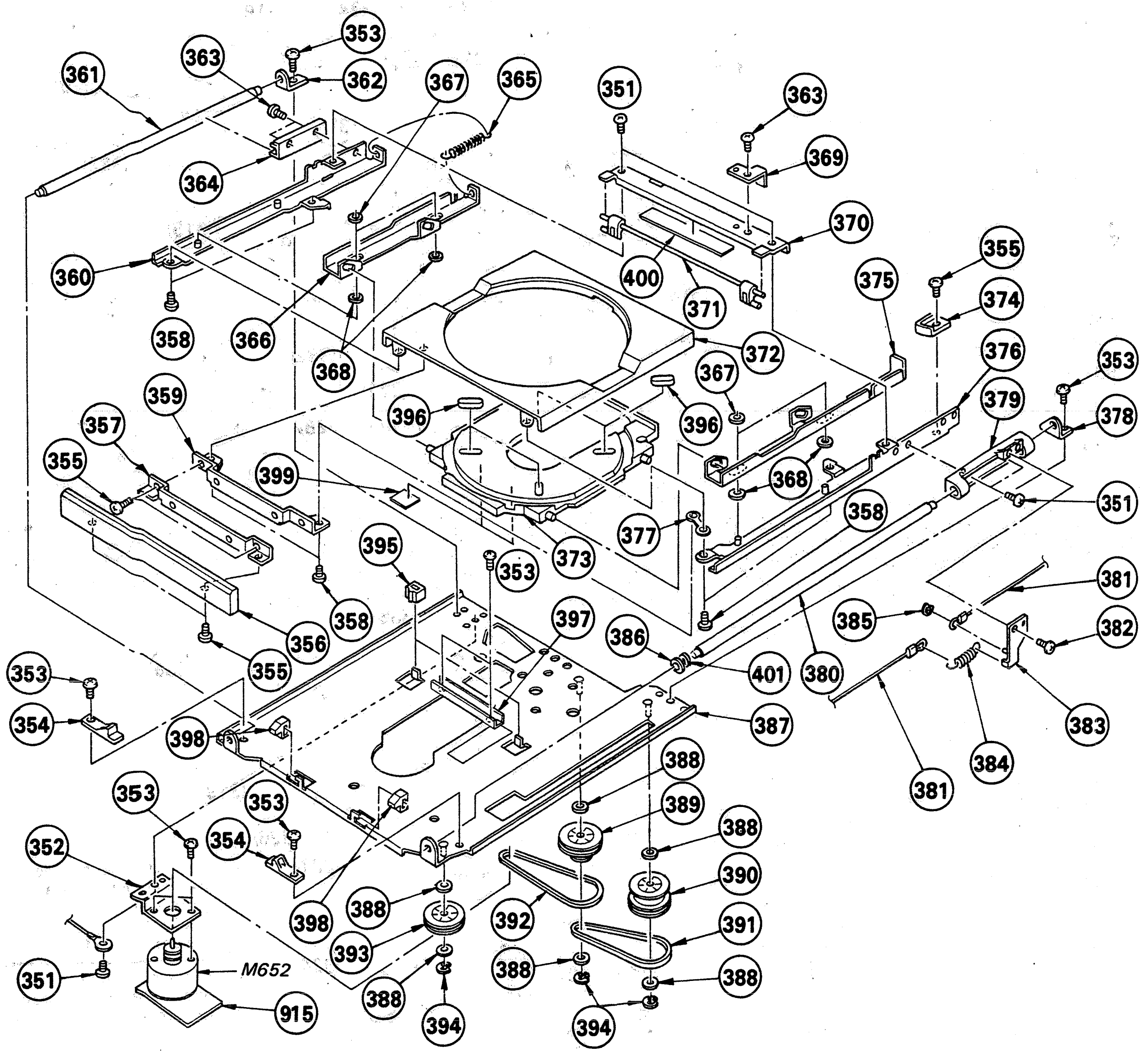

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No.	Part No.	Description	REMARKS
351	7-685-870-09	SCREW +BVTT 3X5 (S)	
352	*4-908-523-01	BRACKET, MOTOR	
353	7-621-259-10	SCREW +P 2.6X3	
354	4-908-540-01	GUIDE, ASSIST	
355	7-621-775-20	SCREW +B 2.6X5	
356	4-908-571-11	PANEL, LOADING	
357	*4-908-539-01	BRACKET (B), LOADING PANEL	
358	7-685-646-29	SCREW +BVTP 3X8 TYPE2 SLIT	
359	*4-908-538-01	BRACKET (A), LOADING PANEL	
360	X-4908-508-1	PLATE ASSY (LEFT), SIDE, TABLE	
361	4-908-505-01	SHAFT (LEFT), GUIDE	
362	*4-908-530-01	PLATE (LEFT), BEARING	
363	7-685-861-09	SCREW +BVTT 2.6X5 (S)	
364	4-908-572-01	BEARING (LEFT), GUIDE	
365	4-908-552-01	SPRING, COMPRESSION	
366	*4-908-562-01	PLATE (LEFT), CAM, DISK	
367	3-558-708-21	WASHER, STOPPER	
368	3-701-439-11	WASHER	
369	*4-908-609-01	PLATE (B), GROUND	
370	*4-908-533-01	REINFORCEMENT, TABLE	
371	4-908-534-01	LEVER, FUNCTION	
372	4-908-584-01	TABLE, DISK	
373	X-4908-506-1	PLATE ASSY, DISK	
374	4-908-520-01	PLATE, LOCK	
375	*4-908-561-01	PLATE (RIGHT), CAM, DISK	
376	X-4908-507-1	PLATE ASSY (RIGHT), SIDE,TABLE	
377	*4-908-608-01	PLATE (A), GROUND	
378	*4-908-531-01	PLATE (RIGHT), BEARING	
379	4-908-574-01	BEARING (RIGHT), GUIDE	
380	4-908-503-01	SHAFT (RIGHT), GUIDE	
381	4-908-544-01	ROPE	
382	7-685-132-19	SCREW +BTP 2.6X5 TYPE2 N-S	
383	*X-4908-502-1	BRACKET ASSY, ROPE	
384	4-908-553-01	SPRING, COMPRESSION (ROPE)	
385	7-624-104-04	STOP RING 2.0, TYPE -E	
386	4-908-550-01	STOPPER, RUBBER	
387	*X-4908-511-1	CHASSIS ASSY, MECHANICAL	
388	3-701-441-21	WASHER	
389	4-908-519-01	PULLEY (A)	
390	4-908-525-01	PULLEY (C)	
391	3-671-077-00	BELT, FF	
392	4-908-591-01	BELT, DRIVING	
393	4-908-524-01	PULLEY (B)	
394	7-624-106-04	STOP RING 3.0, TYPE -E	
395	4-887-175-00	RUBBER, STOPPER	
396	4-908-543-01	RETAINER, DISK	
397	*4-908-598-01	REINFORCEMENT, CHASSIS	
398	4-908-590-01	RETAINER, TABLE	
399	*4-908-964-01	SHEET, PS, DT	
400	*4-908-965-01	SHEET	
401	4-908-622-01	CUSHION (S)	
915	*1-614-026-11	PC BOARD, LOADING MOTOR	

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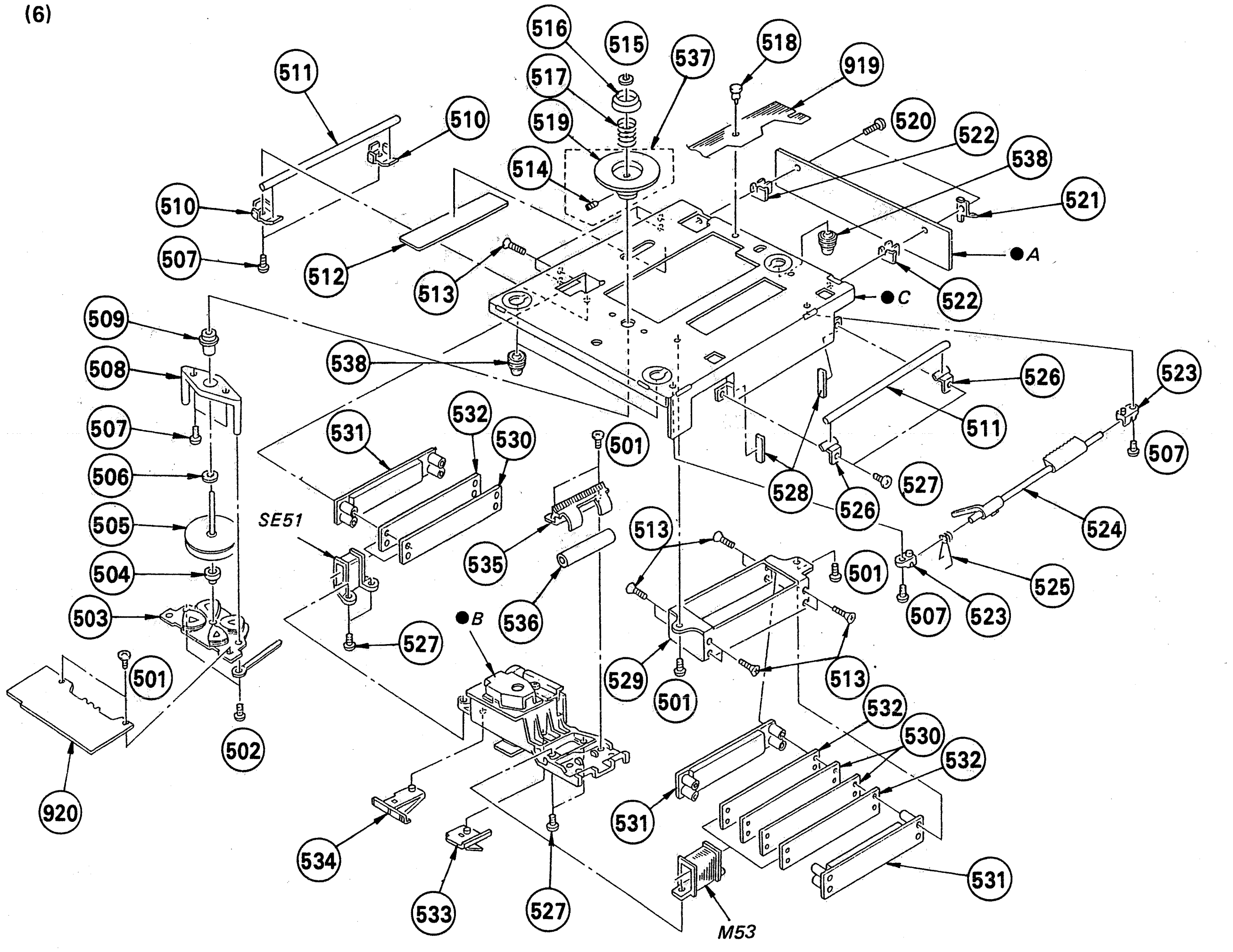

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No.	Part No.	Description	REMARKS
501	7-621-775-10	SCREW +B 2.6X4	
502	7-685-533-19	SCREW +BTP 2.6X6 TYPE2 N-S	
503	A-4675-068-A	BRACKET ASSY, MOTOR (L151,152)	
504	2-622-105-01	RETAINER, THRUST	
505	A-4675-069-A	ROTOR ASSY	
506	3-701-439-21	WASHER	
507	7-621-773-95	SCREW +B 2.6X6	
508	4-908-216-01	HOLDER, STATOR	
509	4-908-206-01	BEARING, SPINDLE	
510	4-908-205-01	RETAINER (A), SLIDE SHAFT	
511	4-908-201-01	SHAFT, SLIDE	
512	2-270-836-00	RUBBER, RETAINER	
513	7-621-559-80	SCREW +K 2.6X14	
514	7-621-734-09	SET-SCT, HEX. 2.6X3	
515	3-558-708-21	WASHER, STOPPER	
516	4-908-212-01	CAP, CENTERING	
517	4-908-213-01	SPRING, COMPRESSION	
518	3-531-576-01	RIVET	
519	4-908-211-02	PULLEY, DISK	
520	7-621-259-65	SCREW +P 2.6X10	
521	*4-908-232-01	LUG	
522	4-908-222-01	HOLDER, PC BOARD	
523	4-908-220-01	HOLDER, ROD	
524	4-908-227-01	LEVER, LOCK	
525	4-908-230-01	SPRING	
526	4-908-217-01	RETAINER (B), SLIDE SHAFT	
527	7-621-775-20	SCREW +B 2.6X5	
528	*3-548-366-02	CUSHION	
529	4-908-203-01	YOKE (A)	
530	4-908-214-01	YOKE (C)-1	
531	A-4675-070-A	MAGNET ASSY, LINEAR	
532	4-908-215-01	YOKE (C)-2	
533	4-908-225-01	RETAINER (A), LEAD	
534	4-908-219-01	RETAINER (B), LEAD	
535	4-908-224-01	HOLDER, BEARING	
536	4-908-221-01	BEARING	
537	X-4908-202-1	PULLEY ASSY, DISK	
538	4-908-593-01	INSULATOR	
919	A-4646-215-A	MOUNTED PCB, FLEXIBLE	
920	1-614-086-11	PC BOARD, BSL MOTOR	

NOTE:
- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- If there are two or more same circuitsin a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:
MF:μF, PF:μμF.

RESISTORS
- All resistors are in ohms.
- F : nonflammable

COILS
- MMH : mH, UH : μH

SEMICONDUCTORS
In each case, U : μ, for example:
UA...: μA..., UPA...: μPA..., UPC...: μPC, UPD...: μPD...

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
901	1-452-340-11	MAGNET			
902	*1-611-717-11	PC BOARD, N			
903	*1-614-014-11	PC BOARD, P.SW			
904	*1-614-016-11	PC BOARD, SIRCS			
905	*1-614-021-11	PC BOARD, ACC			
906	*1-614-019-11	PC BOARD, LINE OUT			
907	*A-4651-033-A	(302)...........MOUNTED PCB, MAIN			
	A-4651-034-A	(302ES,520ES)...MOUNTED PCB, MAIN			
908	*1-614-015-11	PC BOARD, H.P			
909	*1-614-013-11	PC BOARD, DISPLAY			
910	*1-535-139-00	BASE POST 19MM (10MM PITCH) 2P			
911	*1-614-017-11	(302).....PC BOARD, LAMP			
912	*1-614-023-11	PC BOARD, L.C SW			
913	*1-614-024-11	PC BOARD, CHUCKING SW			
914	*1-614-025-11	PC BOARD, CHUCKING MOTOR			
915	*1-614-026-11	PC BOARD, LOADING MOTOR			
916	....				
917	*1-614-028-11	PC BOARD, LASER SW			
918	*1-614-029-11	PC BOARD, LOAD IN SW			
919	A-4646-215-A	MOUNTED PCB, FLEXIBLE			
920	*1-614-086-11	PC BOARD, BSL MOTOR			
921	1-533-131-00	(302ES;AEP,G-AEP,UK)...HOLDER, FUSE			
922	1-526-565-00	(302ES;E)...AC PLUG ADAPTOR			
923	....				
924	*1-614-030-11	PC BOARD, LOAD OUT SW			
C51	1-135-008-00	TANTALUM(CHIP)	2.2MF	20%	6.3V
C151	1-162-302-31	CERAMIC	0.0022MF	20%	16V
C152	1-162-302-31	CERAMIC	0.0022MF	20%	16V
C153	1-161-494-00	CERAMIC	0.022MF	30%	25V
C154	1-161-494-00	CERAMIC	0.022MF	30%	25V
C201	1-136-169-00	FILM	0.22MF	5%	50V
C202	1-162-302-31	CERAMIC	0.0022MF	30%	16V
C203	1-136-165-00	FILM	0.1MF	5%	50V
C204	1-162-290-31	CERAMIC	470PF	10%	50V
C205	1-130-475-00	MYLAR	0.0022MF	5%	50V
C206	1-131-371-00	TANTALUM	10MF	10%	16V
C207	1-136-159-00	FILM	0.033MF	5%	50V
C208	1-136-169-00	FILM	0.22MF	5%	50V
C209	1-136-161-00	FILM	0.047MF	5%	50V
C210	1-162-294-31	CERAMIC	0.001MF	10%	50V
C211	1-162-302-31	CERAMIC	0.0022MF	30%	16V
C212	1-130-487-00	MYLAR	0.022MF	5%	50V
C213	1-162-291-31	CERAMIC	560PF	10%	50V
C214	1-130-475-00	MYLAR	0.0022MF	5%	50V
C215	1-136-165-00	FILM	0.1MF	5%	50V
C216	1-130-487-00	MYLAR	0.022MF	5%	50V

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
C217	1-136-165-00	FILM	0.1MF	5%	50V
C218	1-162-304-31	CERAMIC	0.0047MF	30%	16V
C219	1-136-163-00	FILM	0.068MF	5%	50V
C221	1-123-318-00	ELECT	33MF	20%	16V
C222	1-123-318-00	ELECT	33MF	20%	16V
C223	1-131-369-00	TANTALUM	4.7MF	10%	16V
C235	1-162-294-31	CERAMIC	0.001MF	10%	50V
C236	1-136-169-00	FILM	0.22MF	5%	50V
C237	1-136-161-00	FILM	0.047MF	5%	50V
C301	1-123-356-00	ELECT	10MF	20%	50V
C302	1-162-302-31	CERAMIC	0.0022MF	30%	16V
C303	1-162-302-31	CERAMIC	0.0022MF	30%	16V
C304	1-102-725-00	CERAMIC	36PF	5%	50V
C305	1-102-658-00	CERAMIC	180PF	5%	50V
C306	1-102-647-00	CERAMIC	39PF	5%	50V
C307	1-102-523-00	CERAMIC	56PF	5%	50V
C308	1-162-294-31	CERAMIC	0.001MF	10%	50V
C309	1-102-514-00	CERAMIC	22PF	5%	50V
C310	1-123-318-00	ELECT	33MF	20%	16V
C311	1-123-318-00	ELECT	33MF	20%	16V
C312	1-123-318-00	ELECT	33MF	20%	16V
C313	1-123-318-00	ELECT	33MF	20%	16V
C314	1-162-284-31	CERAMIC	150PF	10%	50V
C315	1-162-284-31	CERAMIC	150PF	10%	50V
C316	1-123-318-00	ELECT	33MF	20%	16V
C317	1-162-306-31	CERAMIC	0.01MF	30%	16V
C318	1-162-306-31	CERAMIC	0.01MF	30%	16V
C319	1-123-318-00	ELECT	33MF	20%	16V
C321	1-130-487-00	MYLAR	0.022MF	5%	50V
C323	1-162-294-31	CERAMIC	0.001MF	10%	50V
C324	1-123-318-00	ELECT	33MF	20%	16V
C325	1-123-318-00	ELECT	33MF	20%	16V
C327	1-123-318-00	ELECT	33MF	20%	16V
C330	1-101-005-00	CERAMIC	0.022MF		50V
C331	1-101-005-00	CERAMIC	0.022MF		50V
C332	1-131-374-00	(302)...TANTALUM	33MF	10%	16V
C333	1-101-005-00	CERAMIC	0.022MF		50V
C334	1-101-005-00	CERAMIC	0.022MF		50V
C348	1-130-483-00	MYLAR	0.01MF	5%	50V
C349	1-123-380-00	ELECT	1MF	20%	50V
C351	1-123-380-00	ELECT	1MF	20%	50V
C353	1-136-165-00	FILM	0.1MF	5%	50V
C354	1-130-481-00	MYLAR	0.0068MF	5%	50V
C355	1-136-169-00	FILM	0.22MF	5%	50V
C356	1-162-290-31	CERAMIC	470PF	10%	50V
C360	1-136-165-00	FILM	0.1MF	5%	50V

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
C361	1-123-330-00	ELECT	22MF	20%	25V
C362	1-123-330-00	ELECT	22MF	20%	25V
C363	1-161-974-00	CERAMIC	0.1MF	20%	16V
C364	1-161-974-00	CERAMIC	0.1MF	20%	16V
C365	1-102-114-00	CERAMIC	470PF	10%	50V
C366	1-161-974-00	CERAMIC	0.1MF	20%	16V
C367	1-161-974-00	CERAMIC	0.1MF	20%	16V
C401	1-104-230-00	POLYSTYRENE	0.0015MF	5%	50V
C402	1-123-384-00	ELECT	10MF	20%	50V
C403	1-123-384-00	ELECT	10MF	20%	50V
C404	1-123-384-00	ELECT	10MF	20%	50V
C405	1-104-233-00	POLYSTYRENE	220PF	5%	125V
C406	1-123-384-00	ELECT	10MF	20%	50V
C407	1-130-967-00	FILM	0.0027MF	3%	100V
C408	1-136-230-00	FILM	0.0022MF	3%	100V
C409	1-123-318-00	ELECT	33MF	20%	16V
C410	1-136-257-00	FILM	0.0039MF	3%	100V
C411	1-136-252-00	FILM	0.0015MF	3%	100V
C412	1-123-334-00	(302).....ELECT	220MF	20%	25V
C412	1-123-694-52	(302ES,520ES)...ELECT	220MF	20%	25V
C413	1-130-955-00	FILM	0.01MF	3%	100V
C414	1-104-260-11	POLYSTYRENE	510PF	2%	125V
C415	1-130-340-00	FILM	0.018MF	3%	100V
C416	1-130-340-00	FILM	0.018MF	3%	100V
C417	1-136-252-00	FILM	0.0015MF	3%	100V
C419	1-123-356-00	ELECT	10MF	20%	50V
C420	1-123-330-00	(302).....ELECT	22MF	20%	25V
C420	1-123-700-52	(302ES,520ES)...ELECT	22MF	20%	35V
C421	1-101-005-00	CERAMIC	0.022MF		50V
C431	1-123-330-00	ELECT	22MF	20%	25V
C451	1-162-290-00	CERAMIC	470PF	10%	50V
C501	1-104-230-00	POLYSTYRENE	0.0015MF	5%	50V
C502	1-123-384-00	ELECT	10MF	20%	50V
C503	1-123-384-00	ELECT	10MF	20%	50V
C504	1-123-384-00	ELECT	10MF	20%	50V
C505	1-104-233-00	POLYSTYRENE	220PF	5%	125V
C506	1-123-384-00	ELECT	10MF	20%	50V
C507	1-130-967-00	FILM	0.0027MF	3%	100V
C508	1-136-230-00	FILM	0.0022MF	3%	100V
C509	1-123-318-00	ELECT	33MF	20%	16V
C510	1-136-257-00	FILM	0.0039MF	3%	100V
C511	1-136-252-00	FILM	0.0015MF	3%	100V
C512	1-123-334-00	(302).....ELECT	220MF	20%	25V
C512	1-123-694-52	(302ES,520ES)...ELECT	220MF	20%	25V

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
C513	1-130-955-00	FILM	0.01MF	3%	100V
C514	1-104-260-11	POLYSTYRENE	510PF	2%	125V
C515	1-130-340-00	FILM	0.018MF	3%	100V
C516	1-130-340-00	FILM	0.018MF	3%	100V
C517	1-136-252-00	FILM	0.0015MF	3%	100V
C519	1-123-356-00	ELECT	10MF	20%	50V
C520	1-123-330-00	(302).....ELECT	22MF	20%	25V
C520	1-123-700-52	(302ES,520ES)...ELECT	22MF	20%	35V
C521	1-101-005-00	CERAMIC	0.022MF		50V
C531	1-123-330-00	ELECT	22MF	20%	25V
C551	1-162-290-00	CERAMIC	470PF	10%	50V
C601	1-162-294-31	CERAMIC	0.001MF	10%	50V
C602	1-162-294-31	CERAMIC	0.001MF	10%	50V
C651	1-136-157-00	FILM	0.022MF	5%	50V
C652	1-136-157-00	FILM	0.022MF	5%	50V
C653	1-136-157-00	FILM	0.022MF	5%	50V
C654	1-130-479-00	MYLAR	0.0047MF	5%	50V
C655	1-130-479-00	MYLAR	0.0047MF	5%	50V
C701	1-162-306-31	CERAMIC	0.01MF	30%	16V
C702	1-162-113-00	CERAMIC	0.01MF	30%	16V
C801	1-162-294-31	CERAMIC	0.001MF	10%	50V
C851	1-123-611-00	ELECT	1MF	20%	50V
C852	1-123-613-00	ELECT	3.3MF	20%	50V
C853	1-162-288-31	CERAMIC	330PF	10%	50V
C854	1-123-821-00	ELECT	47MF	20%	16V
C902	1-123-339-00	ELECT	3300MF	20%	25V
C903	1-124-348-00	ELECT	470MF	20%	35V
C905	1-123-491-51	(302).....ELECT	4700MF	20%	16V
C905	1-123-327-00	(302ES,520ES)...ELECT	4700MF	20%	16V
C906	1-123-311-00	ELECT	1000MF	20%	10V
C911	1-123-346-00	ELECT	220MF	20%	35V
C912	1-123-360-00	ELECT	100MF	20%	50V
C913	1-123-345-00	ELECT	100MF	20%	35V
C951	1-130-789-00	FILM	1MF	10%	100V
C952	1-123-339-00	ELECT	3300MF	20%	25V
C953	1-124-348-00	ELECT	470MF	20%	35V
C955	1-123-326-00	(302).....ELECT	3300MF	20%	16V
C955	1-123-339-00	(302ES,520ES)...ELECT	3300MF	20%	25V
C956	1-123-311-00	ELECT	1000MF	20%	10V
C961	1-136-173-00	FILM	0.47MF	5%	50V
C962	1-123-307-00	ELECT	100MF	20%	10V
C991	⚠ 1-161-744-00	CERAMIC	0.01MF	[illegible]	400V
C992	⚠ 1-162-742-00	(302ES)...CERAMIC	0.0022MF	20%	400V
C993	⚠ 1-161-742-00	CERAMIC	0.0022MF	20%	400V
C994	⚠ 1-162-742-00	(302ES)...CERAMIC	0.0022MF	20%	400V
C995	⚠ 1-162-742-00	(302ES)...CERAMIC	0.0022MF	20%	400V

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ELECTRICAL PARTS

Ref.No.	Part No.	Description
CNJ301	1-562-677-11	SOCKET, CONNECTOR
CNJ411	1-507-912-11	(302)...........JACK, PIN 2P
CNJ411	1-507-912-21	(302ES,520ES)...JACK, PIN 2P
CNJ412	1-507-863-11	JACK, LARGE TYPE, HEADPHONES
CNJ511	1-507-912-11	JACK, PIN 2P
⚠CNJ991	1-526-609-00	(302;US,302ES,E,520ES)...CONNECTOR, AC OUTLET
⚠CNJ991	1-526-751-11	(302ES;UK)..........OUTLET, AC
⚠CNJ991	1-526-794-11	(302ES;AEP,G-AEP)...OUTLET, AC
⚠CNJ991	1-526-882-00	(302;Canadian)......OUTLET, AC
CNP151	*1-560-073-00	PIN, CONNECTOR (U TYPE)
CNP201	1-564-710-11	PIN, CONNECTOR (SMALL TYPE) 8P
CNP202	*1-564-707-11	PIN, CONNECTOR (SMALL TYPE) 5P
CNP203	*1-564-706-11	PIN, CONNECTOR (SMALL TYPE) 4P
CNP301	*1-564-507-41	PLUG, CONNECTOR 4P
CNP302	1-564-708-11	(302ES)...PIN, CONNECTOR (SMALL TYPE) 6P
CNP302	1-564-710-11	(302).....PIN, CONNECTOR (SMALL TYPE) 8P
CNP303	*1-560-064-00	PIN, CONNECTOR 6P
CNP304	*1-564-712-11	PIN, CONNECTOR (SMALL TYPE)10P
CNP305	1-564-710-11	PIN, CONNECTOR (SMALL TYPE) 8P
CNP306	*1-564-505-11	PLUG, CONNECTOR 2P
CNP307	*1-564-507-21	PLUG, CONNECTOR 4P
CNP308	*1-564-506-11	PLUG, CONNECTOR 3P
CNP309	*1-564-506-11	PLUG, CONNECTOR 3P
CNP310	*1-564-507-31	PLUG, CONNECTOR 4P
CNP401	*1-564-507-41	PLUG, CONNECTOR 4P
CNP402	*1-564-509-11	PLUG, CONNECTOR 6P
CNP404	*1-564-506-11	PLUG, CONNECTOR 3P
CNP504	*1-564-506-11	PLUG, CONNECTOR 3P
CNP601	*1-564-519-11	PLUG, CONNECTOR 4P
CNP602	*1-564-505-11	PLUG, CONNECTOR 2P
CNP603	*1-564-505-21	PLUG, CONNECTOR 2P
CNP604	*1-564-505-31	PLUG, CONNECTOR 2P
CNP605	*1-564-505-41	PLUG, CONNECTOR 2P
CNP606	*1-564-506-11	PLUG, CONNECTOR 3P
CNP607	*1-564-517-11	PLUG, CONNECTOR 2P
CNP702	*1-564-519-21	PLUG, CONNECTOR 4P
CNP705	*1-560-039-00	PIN, CONNECTOR
CNP706	*1-560-039-00	PIN, CONNECTOR
CNP708	*1-564-725-11	PIN, CONNECTOR (SMALL TYPE) 9P
CNP901	*1-564-505-11	PLUG, CONNECTOR 2P
CNP902	*1-564-507-11	PLUG, CONNECTOR 4P
⚠CNP991	1-555-386-00	(302ES;E)...........CORD, POWER
⚠CNP991	1-555-701-00	(520ES)..............CORD, POWER
⚠CNP991	1-555-795-11	(302ES;AEP,G-AEP)...CORD, POWER
⚠CNP991	1-556-035-11	(302ES;UK)...........CORD, POWER
⚠CNP991	1-556-874-00	(302;US) ....CORD, POWER
⚠CNP991	1-557-577-11	(302;Canadian)......CORD, POWER

ELECTRICAL PARTS

Ref.No.	Part No.	Description
D51	8-719-911-19	DIODE 1SS119
D201	8-719-951-13	DIODE HZ5CLL
D202	8-719-911-19	DIODE 1SS119
D205	8-719-911-19	DIODE 1SS119
D211	8-719-911-19	DIODE 1SS119
D213	8-719-101-32	DIODE RD2.7EL1
D301	8-719-911-19	DIODE 1SS119
D302	8-719-902-39	DIODE KV1236Z
D651	8-719-200-02	DIODE 10E-2
D652	8-719-200-02	DIODE 10E-2
D653	8-719-200-02	DIODE 10E-2
D701	8-719-911-19	DIODE 1SS119
D702	8-719-911-19	DIODE 1SS119
D703	8-719-911-19	DIODE 1SS119
D704	8-719-100-29	DIODE RD5.1EB1
D805	8-719-907-81	DIODE BG5535S
D806	8-719-907-80	DIODE AA5535S
D807	8-719-918-57	DIODE GL-5NG27
D809	8-719-907-81	DIODE BG5535S
D851	8-719-110-32	DIODE PH302B
D901	8-719-200-31	DIODE 21DQ05
D902	8-719-200-31	DIODE 21DQ05
D903	8-719-200-31	DIODE 21DQ05
D904	8-719-200-31	DIODE 21DQ05
D905	8-719-210-12	DIODE 10DF2
D906	8-719-210-12	DIODE 10DF2
D907	8-719-210-12	DIODE 10DF2
D908	8-719-210-12	DIODE 10DF2
D909	8-719-200-02	DIODE 10E-2
D910	8-719-200-02	DIODE 10E-2
D911	8-719-911-19	DIODE 1SS119
D912	8-719-911-19	DIODE 1SS119
D913	8-719-101-07	DIODE RD33EB3
D914	8-719-911-19	DIODE 1SS119
D915	8-719-100-48	DIODE RD8.2EB2
F901	⚠1-532-078-00	(302ES;AEP,G-AEP)...FUSE, TIME LAG (1A)
F901	⚠1-532-286-00	(302ES;UK)....FUSE, TIME LAG (2.5A)
F902	⚠1-532-078-00	(302ES;AEP,G-AEP)...FUSE, TIME LAG (1A)
FLD201	1-519-304-00	INDICATOR TUBE, FLUORESCENT
H151	8-719-800-31	DIODE THS103A-1
H152	8-719-800-31	DIODE THS103A-1
IC151	8-759-600-02	IC CX20109
IC201	8-752-010-80	IC CX20108
IC202	8-759-700-58	IC NJM4558D-FA

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ELECTRICAL PARTS

Ref.No.	Part No.	Description
IC301	8-759-602-25	IC M50760-414P
IC302	8-759-913-84	IC MSM6404A-41RS
IC303	8-759-913-82	IC MSM6404A-39RS
IC304	8-759-202-13	IC TC74HCU04P
IC305	8-759-100-82	IC UPC4082C
IC306	8-759-145-58	IC UPC4558C
IC307	8-759-912-52	IC CX23035
IC308	8-759-913-72	IC MB8416-20LPF
IC309	8-759-912-53	IC CX23034
IC310	8-752-015-20	IC CX20152
IC311	8-759-140-53	IC UPD4053BC
IC312	8-759-984-66	IC MB84066B
IC401	8-759-910-75	IC TDB0353DP
IC402	8-759-602-33	IC CX20197
IC403	8-759-602-33	IC CX20197
IC501	8-759-910-75	IC TDB0353DP
IC502	8-759-602-33	IC CX20197
IC503	8-759-602-33	IC CX20197
IC801	8-759-600-35	IC M54940P
IC851	8-752-010-60	IC CX20106
IC901	8-759-700-51	IC NJM7805A
IC902	8-759-700-28	IC NJM7905A
IC903	8-759-170-12	IC UPC78M12H
IC904	8-759-700-24	IC NJM79M12A
IC905	8-759-700-11	IC NJM78M05A
IC906	8-759-700-20	IC NJM79M05A
L51	1-408-563-00	MICRO INDUCTOR 10UH
L301	1-426-212-11	COIL (RF)
L302	1-406-123-11	COIL (OSC)
L303	1-408-597-00	MICRO INDUCTOR 3.3UH
L304	1-408-597-00	MICRO INDUCTOR 3.3UH
L305	1-408-597-00	MICRO INDUCTOR 3.3UH
L601	1-408-117-00	MICRO INDUCTOR 10UH
L901 ⚠	1-421-580-00	(302,520ES)...TRANSFORMER, [illegible] [illegible] LINE FILTER (LFT)
L901 ⚠	1-421-340-11	(302ES;AEP,G-AEP,UK)...LINE FILTER
M53	1-422-197-13	COIL (DRIVE)
M651	X-4902-019-1	MOTOR ASSY, CHUCKING
M652	A-4608-303-A	MOTOR ASSY, LOADING
PL901	1-518-370-00	(302)...LAMP, PILOT
PT901⚠	1-448-016-11	(302,520ES)....TRANSFORMER, POWER
PT901⚠	1-448-017-11	(302ES;E).....TRANSFORMER, POWER
PT901⚠	1-448-018-11	(302ES;AEP,G-AEP,UK)..TRANSFORMER, POWER
PS301	1-532-685-00	LINK, IC
PS901	1-532-675-00	LINK, IC
PS902	1-532-675-00	LINK, IC

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ELECTRICAL PARTS

Ref.No.	Part No.	Description			
PS951	1-532-675-00	LINK, IC			
PS952	1-532-675-00	LINK, IC			
Q151	8-729-177-44	TRANSISTOR 2SD774-5			
Q152	8-729-103-43	TRANSISTOR 2SB734-2			
Q153	8-729-177-44	TRANSISTOR 2SD774-5			
Q154	8-729-103-43	TRANSISTOR 2SB734-2			
Q201	8-729-177-44	TRANSISTOR 2SD774-5			
Q202	8-729-374-02	TRANSISTOR 2SB740			
Q203	8-729-177-44	TRANSISTOR 2SD774-5			
Q204	8-729-374-02	TRANSISTOR 2SB740			
Q205	8-729-177-44	TRANSISTOR 2SD774-5			
Q206	8-729-374-02	TRANSISTOR 2SB740			
Q209	8-729-117-54	TRANSISTOR 2SA1175			
Q210	8-729-100-13	TRANSISTOR 2SC2001			
Q211	8-729-900-74	TRANSISTOR DTC143TS			
Q212	8-729-900-74	TRANSISTOR DTC143TS			
Q213	8-729-900-89	TRANSISTOR DTC144ES			
Q301	8-729-177-44	TRANSISTOR 2SD774-5			
Q302	8-729-374-02	TRANSISTOR 2SB740			
Q303	8-729-900-81	TRANSISTOR DTC114ES			
Q304	8-729-900-81	TRANSISTOR DTC114ES			
Q305	8-729-900-81	TRANSISTOR DTC114ES			
Q306	8-729-900-81	TRANSISTOR DTC114ES			
Q307	8-729-900-62	TRANSISTOR DTA114ES			
Q308	8-729-900-81	TRANSISTOR DTC114ES			
Q309	8-729-178-55	TRANSISTOR 2SC2785-E			
Q310	8-729-900-81	TRANSISTOR DTC114ES			
Q401	8-729-800-43	TRANSISTOR 2SK152			
Q501	8-729-800-43	TRANSISTOR 2SK152			
Q801	8-729-900-46	TRANSISTOR DTC143TF			
Q802	8-729-900-46	TRANSISTOR DTC143TF			
Q803	8-729-900-46	TRANSISTOR DTC143TF			
Q804	8-729-987-42	TRANSISTOR 2SA874			
Q901	8-729-177-44	TRANSISTOR 2SD774-5			
Q902	8-729-178-55	TRANSISTOR 2SC2785-E			
Q903	8-729-178-55	TRANSISTOR 2SC2785-E			
Q904	8-729-900-62	TRANSISTOR DTA114ES			
Q905	8-729-117-54	TRANSISTOR 2SA1175			
Q906	8-729-900-81	TRANSISTOR DTC114ES			
R151	1-247-831-00	CARBON	1K	5%	1/6W
R152	1-247-831-00	CARBON	1K	5%	1/6W
R153	1-247-831-00	CARBON	1K	5%	1/6W
R154	1-247-831-00	CARBON	1K	5%	1/6W
R155	1-247-831-00	CARBON	1K	5%	1/6W
R156	1-247-831-00	CARBON	1K	5%	1/6W

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
R157	1-247-887-00	CARBON	220K	5%	1/6W
R158	1-247-887-00	CARBON	220K	5%	1/6W
R159	1-247-887-00	CARBON	220K	5%	1/6W
R160	1-247-887-00	CARBON	220K	5%	1/6W
R201	1-247-863-00	CARBON	22K	5%	1/6W
R202	1-247-851-00	CARBON	6.8K	5%	1/6W
R203	1-247-867-00	CARBON	33K	5%	1/6W
R204	1-247-847-00	CARBON	4.7K	5%	1/6W
R205	1-247-819-00	CARBON	330	5%	1/6W
R206	1-247-865-00	CARBON	27K	5%	1/6W
R207	1-247-807-00	CARBON	100	5%	1/6W
R208	1-247-851-00	CARBON	6.8K	5%	1/6W
R209	1-247-864-00	CARBON	24K	5%	1/6W
R210	1-247-851-00	CARBON	6.8K	5%	1/6W
R211	1-247-831-00	CARBON	1K	5%	1/6W
R212	1-247-859-00	CARBON	15K	5%	1/6W
R213	1-247-855-00	CARBON	10K	5%	1/6W
R214	1-247-837-00	CARBON	1.8K	5%	1/6W
R215	1-247-879-00	CARBON	100K	5%	1/6W
R216	1-247-869-00	CARBON	39K	5%	1/6W
R217	1-247-855-00	CARBON	10K	5%	1/6W
R218	1-247-903-00	CARBON	1M	5%	1/6W
R219	1-247-831-00	CARBON	1K	5%	1/6W
R220	1-247-807-00	CARBON	100	5%	1/6W
R221	1-247-863-00	CARBON	22K	5%	1/6W
R222	1-247-857-00	CARBON	12K	5%	1/6W
R223	1-247-841-00	CARBON	2.7K	5%	1/6W
R224	1-247-869-00	CARBON	39K	5%	1/6W
R225	1-247-843-00	CARBON	3.3K	5%	1/6W
R226	1-247-859-00	CARBON	15K	5%	1/6W
R227	1-247-845-00	CARBON	3.9K	5%	1/6W
R228	1-247-815-00	CARBON	220	5%	1/6W
R229	1-247-865-00	CARBON	27K	5%	1/6W
R231	1-247-883-00	CARBON	150K	5%	1/6W
R232	1-247-899-00	CARBON	680K	5%	1/6W
R235	1-247-855-00	CARBON	10K	5%	1/6W
R236	1-247-855-00	CARBON	10K	5%	1/6W
R242	1-247-855-00	CARBON	10K	5%	1/6W
R243	1-247-895-00	CARBON	470K	5%	1/6W
R244	1-247-839-00	CARBON	2.2K	5%	1/6W
R245	1-247-855-00	CARBON	10K	5%	1/6W
R246	1-247-831-00	CARBON	1K	5%	1/6W
R247	1-247-871-00	CARBON	47K	5%	1/6W
R301	1-247-847-00	CARBON	4.7K	5%	1/6W
R302	1-247-841-00	CARBON	2.7K	5%	1/6W

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
R303	1-215-453-00	METAL	22K	1%	1/6W
R304	1-215-453-00	METAL	22K	1%	1/6W
R305	1-247-851-00	CARBON	6.8K	5%	1/6W
R306	1-247-857-00	CARBON	12K	5%	1/6W
R307	1-247-867-00	CARBON	33K	5%	1/6W
R308	1-247-831-00	CARBON	1K	5%	1/6W
R309	1-247-879-00	CARBON	100K	5%	1/6W
R310	1-247-879-00	CARBON	100K	5%	1/6W
R311	1-247-879-00	CARBON	100K	5%	1/6W
R313	1-214-741-00	METAL	3.3K	1%	1/4W
R314	1-214-745-00	METAL	4.7K	1%	1/4W
R315	1-214-769-00	METAL	47K	1%	1/4W
R316	1-214-745-00	METAL	4.7K	1%	1/4W
R317	1-247-855-00	CARBON	10K	5%	1/6W
R318	1-247-855-00	CARBON	10K	5%	1/6W
R319	1-247-903-00	CARBON	1M	5%	1/6W
R320	1-247-843-00	CARBON	3.3K	5%	1/6W
R321	1-247-871-00	CARBON	47K	5%	1/6W
R322	1-247-855-00	CARBON	10K	5%	1/6W
R323	1-247-855-00	CARBON	10K	5%	1/6W
R324	1-247-855-00	CARBON	10K	5%	1/6W
R325	1-247-863-00	CARBON	22K	5%	1/6W
R326	1-247-863-00	CARBON	22K	5%	1/6W
R327	1-247-855-00	CARBON	10K	5%	1/6W
R351	1-215-441-00	METAL	6.8K	1%	1/6W
R352	1-215-441-00	METAL	6.8K	1%	1/6W
R353	1-247-903-00	CARBON	1M	5%	1/6W
R354	1-247-856-00	CARBON	11K	5%	1/6W
R355	1-247-856-00	CARBON	11K	5%	1/6W
R357	1-247-863-00	CARBON	22K	5%	1/6W
R358	1-247-843-00	CARBON	3.3K	5%	1/6W
R359	1-247-869-00	CARBON	39K	5%	1/6W
R360	1-215-453-00	METAL	22K	1%	1/6W
R361	1-247-815-00	CARBON	220	5%	1/6W
R362	1-247-815-00	CARBON	220	5%	1/6W
R363	1-247-887-00	CARBON	220K	5%	1/6W
R365	1-247-851-00	CARBON	6.8K	5%	1/6W
R366	1-247-807-00	CARBON	100	5%	1/6W
R367	1-215-449-00	METAL	15K	1%	1/6W
R368	1-247-807-00	CARBON	100	5%	1/6W
R401	1-214-733-00	METAL	1.5K	1%	1/4W
R402	1-214-742-00	METAL	3.6K	1%	1/4W
R403	1-214-759-00	METAL	18K	1%	1/4W
R404	1-214-745-00	METAL	4.7K	1%	1/4W
R405	1-214-741-00	METAL	3.3K	1%	1/4W

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
R406	1-214-737-00	METAL	2.2K	1%	1/4W
R407	1-214-737-00	METAL	2.2K	1%	1/4W
R408	1-214-737-00	METAL	2.2K	1%	1/4W
R409	1-214-737-00	METAL	2.2K	1%	1/4W
R410	1-214-738-00	METAL	2.4K	1%	1/4W
R411	1-214-738-00	METAL	2.4K	1%	1/4W
R412	1-214-742-00	METAL	3.6K	1%	1/4W
R413	1-214-731-00	METAL	1.2K	1%	1/4W
R414	1-214-964-00	METAL	1M	1%	1/4W
R415	1-214-742-00	METAL	3.6K	1%	1/4W
R416	1-214-743-00	METAL	3.9K	1%	1/4W
R417	1-214-777-00	METAL	100K	1%	1/4W
R418	1-214-705-00	METAL	100	1%	1/4W
R419	1-214-761-00	METAL	22K	1%	1/4W
R420	1-214-717-00	METAL	330	1%	1/4W
R421	1-247-815-00	CARBON	220	5%	1/6W
R431	1-247-823-00	CARBON	470	5%	1/6W
R432	1-247-831-00	CARBON	1K	5%	1/6W
R433	1-247-847-00	CARBON	4.7K	5%	1/6W
R434	1-247-867-00	CARBON	33K	5%	1/6W
R435	1-247-815-00	CARBON	220	5%	1/6W
R501	1-214-733-00	METAL	1.5K	1%	1/4W
R502	1-214-742-00	METAL	3.6K	1%	1/4W
R503	1-214-759-00	METAL	18K	1%	1/4W
R504	1-214-745-00	METAL	4.7K	1%	1/4W
R505	1-214-741-00	METAL	3.3K	1%	1/4W
R506	1-214-737-00	METAL	2.2K	1%	1/4W
R507	1-214-737-00	METAL	2.2K	1%	1/4W
R508	1-214-737-00	METAL	2.2K	1%	1/4W
R509	1-214-737-00	METAL	2.2K	1%	1/4W
R510	1-214-738-00	METAL	2.4K	1%	1/4W
R511	1-214-738-00	METAL	2.4K	1%	1/4W
R512	1-214-742-00	METAL	3.6K	1%	1/4W
R513	1-214-731-00	METAL	1.2K	1%	1/4W
R514	1-214-964-00	METAL	1M	1%	1/4W
R515	1-214-742-00	METAL	3.6K	1%	1/4W
R516	1-214-743-00	METAL	3.9K	1%	1/4W
R517	1-214-777-00	METAL	100K	1%	1/4W
R518	1-214-705-00	METAL	100	1%	1/4W
R519	1-214-761-00	METAL	22K	1%	1/4W
R520	1-214-717-00	METAL	330	1%	1/4W
R521	1-247-815-00	CARBON	220	5%	1/6W
R531	1-247-823-00	CARBON	470	5%	1/6W
R532	1-247-831-00	CARBON	1K	5%	1/6W
R533	1-247-847-00	CARBON	4.7K	5%	1/6W

ELECTRICAL PARTS

Ref.No.	Part No.	Description				
R534	1-247-867-00	CARBON	33K	5%	1/6W	
R535	1-247-815-00	CARBON	220	5%	1/6W	
R601	1-247-881-00	CARBON	120K	5%	1/6W	
R602	1-247-881-00	CARBON	120K	5%	1/6W	
R603	1-247-885-00	CARBON	180K	5%	1/6W	
R604	1-247-885-00	CARBON	180K	5%	1/6W	
R605	1-247-815-00	CARBON	220	5%	1/6W	
R701	1-247-783-00	CARBON	10	5%	1/6W	
R702	1-247-783-00	CARBON	10	5%	1/6W	
R801	1-247-111-00	CARBON	150	5%	1/4W	
R802	1-247-119-00	CARBON	330	5%	1/4W	
R803	1-247-111-00	CARBON	150	5%	1/4W	
R804	1-247-111-00	CARBON	150	5%	1/4W	
R851	1-247-775-00	CARBON	4.7	5%	1/6W	
R852	1-214-784-00	METAL	200K	1%	1/4W	
R853	1-247-863-00	CARBON	22K	5%	1/6W	
R854	1-247-799-00	CARBON	47	5%	1/6W	
R901 ⚠	1-212-865-00	FUSE	22	5%	1/4W	F
R911 ⚠	1-212-857-00	FUSE	10	5%	1/4W	F
R912	1-247-839-00	CARBON	2.2K	5%	1/6W	
R913	1-244-837-00	CARBON	33	5%	1/2W	
R961	1-247-855-00	CARBON	10K	5%	1/6W	
R962	1-247-859-00	CARBON	15K	5%	1/6W	
R963	1-247-881-00	CARBON	120K	5%	1/6W	
R964	1-247-855-00	CARBON	10K	5%	1/6W	
R965	1-247-847-00	CARBON	4.7K	5%	1/6W	
RV201	1-226-773-00	RES, ADJ, METAL GLAZE 22K				
RV202	1-226-703-00	RES, ADJ, METAL GLAZE 10K				
RV301	1-226-772-00	RES, ADJ, METAL GLAZE 4.7K				
RV401	1-230-313-00	RES, VAR, CARBON 20K/20K, LEVEL				
RV501	1-230-313-00	RES, VAR, CARBON 20K/20K, LEVEL				
RY901	1-515-529-11	RELAY				
S651	1-554-205-00	SWITCH, PUSH				
S652	1-554-205-00	SWITCH, PUSH				
S653	1-553-636-00	SWITCH, MICRO				
S654	1-553-636-00	SWITCH, MICRO				
S655	1-554-205-00	SWITCH, PUSH				
S656	1-554-205-00	SWITCH, PUSH				
S801	1-553-856-00	SWITCH, KEY BOARD, PLAY				
S802	1-553-856-00	SWITCH, KEY BOARD, PAUSE				
S803	1-553-856-00	SWITCH, KEY BOARD, STOP				
S804	1-553-856-00	SWITCH, KEY BOARD, OPEN				
S805	1-553-856-00	SWITCH, KEY BOARD, CLEAR				
S806	1-553-856-00	SWITCH, KEY BOARD, ◀◀				

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

ELECTRICAL PARTS

Ref.No.	Part No.	Description
S807	1-553-856-00	SWITCH, KEY BOARD, ▶▶
S808	1-553-856-00	SWITCH, KEY BOARD, START
S809	1-553-856-00	SWITCH, KEY BOARD, ⏮
S810	1-553-856-00	SWITCH, KEY BOARD, ⏭
S811	1-553-856-00	SWITCH, KEY BOARD, ←
S812	1-553-856-00	SWITCH, KEY BOARD, →
S813	1-553-856-00	SWITCH, KEY BOARD, A↔B
S814	1-553-856-00	SWITCH, KEY BOARD, 1/ALL
S815	1-553-856-00	SWITCH, KEY BOARD, SET
S816	1-553-856-00	SWITCH, KEY BOARD, TIME
S901 ⚠	1-553-318-00	SWITCH, PUSH (AC POWER)(1 KEY), POWER
SE51	1-422-198-11	COIL (SENSOR)
TB901	*1-535-121-00	TERMINAL
VS901⚠	1-552-963-00	(302ES;E)...SWITCH POWER/VOLTAGE SELECT
X301	1-527-532-00	OSCILLATOR, CERAMIC
X302	1-567-336-11	VIBRATOR, CRYSTAL

ACCESSORY & PACKING MATERIAL

No.	Part No.	Description
701	A-4600-438-A	COMMANDER COMPLETE ASSY (RM-D902)
702	1-551-315-11	(302ES,520ES)..CORD, CONNECTION (RK-112)
702	1-551-734-11	(302)....CORD, CONNECTION (RK-74A)
703 ⚠	1-564-085-00	(302ES;UK)...PLUG, AC (CM-35)
704	1-556-372-41	CORD, CONNECTION (4 CORE)
705	3-701-630-00	BAG, POLYETHYLENE
706	3-703-390-01	(302,520ES)...INSTRUCTION
706	3-795-629-14	(302ES;AEP)...INSTRUCTION
707	3-760-149-11	(302ES)....MANUAL, INSTRUCTION
707	3-760-149-21	(302)......MANUAL, INSTRUCTION
707	3-760-149-31	(302; *Canadian*)...MANUAL, INSTRUCTION
707	3-760-149-41	(302ES;AEP,G-AEP)...MANUAL, INSTRUCTION
707	3-760-402-21	(520ES)....MANUAL, INSTRUCTION
708	4-884-695-03	CLEANER, DISK
709	4-907-610-01	JOINT
710	3-304-973-00	SHEET, PROTECTION
711	4-908-440-11	(302).....INDIVIDUAL CARTON
711	4-908-440-21	(302ES)...INDIVIDUAL CARTON
711	4-908-440-31	(520ES)...INDIVIDUAL CARTON
712	4-908-441-01	CUSHION (RIGHT), UPPER
713	4-908-442-01	CUSHION (LEFT), UPPER
714	4-908-443-01	CUSHION, LOWER
715	4-908-602-01	HOLDER, COMMANDER

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